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Symposium on Recent Advances in Surgery

Electrolytes in surgery; gastrointestinal surgery; inguinal hernia; varicose veins; management of burns; present trends in cancer surgery; recent advances in cardiac surgery; these are just a few of the 25 topics discussed in the February Number of the SURGICAL CLINICS OF NORTH AMERICA.

This February Symposium from Chicago on Recent Advances is typical of the postgraduate teaching offered in the SURGICAL CLINICS. Complete contents of this Symposium, and a list of the other Symposia to be presented in 1952, will be found on the next two pages of this JOURNAL.

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THE BALLISTOCARDIOGRAM IN CORONARY ARTERY DISEASE

Robert C. Taymor, M.D., Leon Pordy, M.D., Kenneth Chesky, M.D., Marvin Moser, M.D.
and
Arthur M. Master, M.D., New York

In the absence of a clear-cut history and definite physical findings, the diagnosis of coronary artery disease often becomes a difficult task for the clinician. In the search for supplementary objective evidence, various tests have been developed as aids in the diagnostic study of these patients. The electrocardiogram has been most widely employed for this purpose. However, the resting electrocardiogram is of value only when it shows abnormalities, and it has been well established that a large percentage of patients with coronary artery disease have normal resting electrocardiograms.[1] In 1929 Master and Oppenheimer [2] introduced a test for circulatory function based on the response of the blood pressure and pulse to standard exercise. Subsequently these standards of exercise were employed to determine the effect of exercise on the electrocardiogram in patients with angina pectoris.[3] Considerable experience has now been obtained in the use of the Master "two-step" exercise electrocardiogram, and it is of definite value as an aid in the diagnosis of coronary insufficiency.[1]

The ballistocardiogram is another useful test of cardiac function. Although it had been well established previously that movements of the body resulting from the ejection of blood from the heart could be recorded,[4] extensive investigation in this field awaited the development of a standard instrument by Starr and his coworkers.[5] In addition to working out the normal standards for the ballistocardiograms, Starr investigated the patterns found in various cardiac diseases.[6] He believed that an abnormal ballistocardiogram, despite an absence of other abnormal findings, had a serious prognosis as to the future development of heart disease.[7] The commonest abnormalities of the ballistocardiographic patterns that occurred were poor definition of the I wave, splitting of the J wave (late "M" form), prominence of the H wave (early "M" form) and low amplitude with poor definition of all wave characteristics.[6] Mathers and his associates, using the low-frequency, critically-damped ballistrocardiograph of Nickerson,[8] showed that the abnormal ballistocardiograms in patients with cardiovascular disease may improve towards normal as the clinical status of the patient improves.[9] In studies to determine the value of the ballistocardiogram in the diagnosis of coronary artery disease, Brown and others [10] found that over 90% of the patients with angina pectoris in their series had abnormalities of the ballistocardiogram. On the other hand, the results obtained by Makinson,[11] applying a modification of the Master "two-step" exercise test to the ballistocardiogram, were inconclusive.

All of the preceding studies were performed on the table type of ballistocardiograph which required an expensive and bulky apparatus and greatly limited extensive

From the Cardiographic Laboratories, The Mount Sinai Hospital. Dr. Moser is a trainee of The National Heart Institute. Miss Iris Kanner provided technical assistance in this work.

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2. Master, A. M., and Oppenheimer, E. T.: Simple Exercise Tolerance Test for Circulatory Efficiency with Standard Tables for Normal Individuals, Am. J. M. Sc. **177**: 223, 1929.
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9. Mathers, J. A. L.; Nickerson, J. L.; Fleming, T. C., and Patterson, M. C.: Abnormal Ballistocardiographic Patterns in Cardiovascular Disease as Recorded with the Low-Frequency, Critically-Damped Ballistocardiograph, Am. Heart J. **40**: 390, 1950.
10. Brown, H. R., Jr.; Hoffman, M. J., and de Lalla, V., Jr.: Ballistocardiographic Findings in Patients with Symptoms of Angina Pectoris, Circulation **1**: 132, 1950.
11. Makinson, D. H.: Changes in Ballistocardiogram After Exercise in Normal and Abnormal Subjects, Circulation **2**: 186, 1950.

investigation. In 1949, Dock and Taubman [12] introduced a simple instrument that recorded the ballistocardiogram directly from the body. Although accurate quantitative studies of the ballistocardiogram are difficult to obtain by this method, the records produced are qualitatively similar to those recorded by the more complicated instruments. The simpler machine, also, is readily adaptable to clinical application. It was considered desirable to evaluate this simplified ballistocardiograph for use in clinical cardiology by studying a large series of patients with and without heart disease. The results in a series of normal persons [13] and a preliminary report of the findings in various cardiovascular diseases [14] will be reported separately. It was the purpose of this investigation to determine the value of the photoelectric ballistocardiograph in the diagnosis of coronary artery disease and to correlate the results with those of the Master "two-step" exercise electrocardiogram.

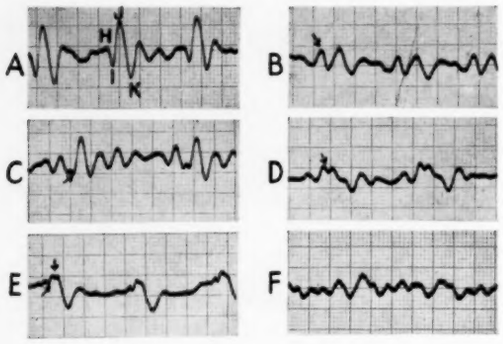

Fig. 1.—Variations of abnormal patterns of the ballistocardiogram. *A*, normal; *B*, prominent "H" wave; *C*, diminished "I" wave; *D*, notched "J" wave; *E*, small "I" and low, notched "J" waves; *F*, bizarre pattern.

MATERIALS AND METHODS

One hundred and ninety-five patients were studied by both the "two-step" exercise electrocardiogram and the ballistocardiogram. The group consisted of patients referred to this department for cardiac study and, also, physicians and employees of the hospital who were undergoing routine cardiovascular examinations. Each patient had a complete history and a physical examination which included cardiac fluoroscopy and a resting electrocardiogram. Only patients with resting electrocardiograms interpreted as normal were included in this investigation. Since the peripheral vascular components of hypertension can influence the ballistocardiogram,[14] hypertensive patients were excluded from this study. After a resting electrocardiogram and ballistocardiogram were recorded, the patients were exercised according to the standard technique of the Master "two-step" exercise electrocardiographic test. If the single "two-step" test was negative, the double "two-step" test was carried out. The electrocardiogram and, in most cases, the ballistocardiogram were recorded after exercise. The method and interpretation of the "two-step" electrocardiographic test [1] and the technique of recording the ballistocardiogram [13] have been described elsewhere. Interpretation of the ballistocardiogram was based only on the qualitative appearance of the component waves. The ballistocardiographic pattern was examined for amplitude of the component waves and for the presence of slurring or notching. Figure 1*A* illustrates a normal ballistocardiogram. The abnormalities encountered varied from alterations in the I wave to completely bizarre records with no distinguishable wave forms (Fig. 1*B-F*). A record was considered to be normal if no abnormalities were encountered regularly in any phase of respiration. The occasional irregular occurrence of an abnormal pattern in the record was not considered to be significant, since such extraneous factors as slight movement of the patient, will distort the ballistocardiogram. If the pattern in every or any one phase of respiration was predominantly abnormal, the ballistocardiogram was interpreted as abnormal. A borderline ballistocardiogram was one in which there was occasional, but regularly occurring, diminution of I wave amplitude in any one phase of respiration. If the record was normal before and abnormal after exercise (Fig. 2), the patient was considered to have an abnormal ballistocardiogram.

For purposes of reporting, the patients have been divided into three main groups: those with negative Master double "two-step" electrocardiograms, those with positive "two-step" electrocardiograms, and those with borderline "two-step" tests. Each group will be discussed separately. Of the 113 patients with negative double "two-step" tests, there were 91 men and 22 women. The oldest was 78 years of age and the youngest 22. Sixty-two patients were under the age of 50. Ninety-seven of the patients in this group had no symptoms or physical findings suggestive of cardiovascular disease and were considered as having normal histories. Twelve had atypical or very mild symptoms suggestive of heart disease, such as vague precordial pain, and were classified as having atypical histories. Four patients had definite symptoms or other evidence of cardiac disease and were classified as those having typical histories.

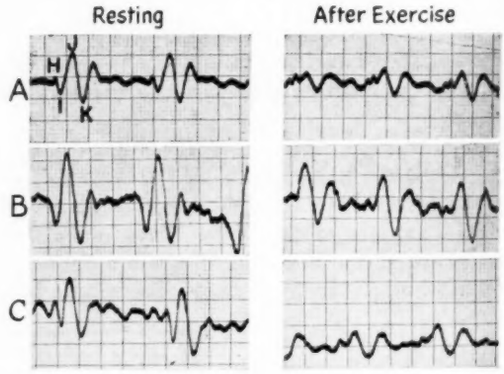

Fig. 2.—The ballistocardiogram recorded before and after exercise. *A*, 50 year-old white man with vague anterior chest pain. Resting electrocardiogram interpreted as normal. Double "two-step" electrocardiogram borderline. Resting ballistocardiogram normal. Postexercise ballistocardiogram shows diminution of "I" and "J" waves. *B*, 48 year-old white man with no symptoms. Resting and double "two-step" electrocardiogram interpreted as normal. Resting ballistocardiogram normal. Postexercise ballistocardiogram shows small "I" wave. *C*, 54-year-old white man with no symptoms. Resting electrocardiogram interpreted as normal. Double "two-step" borderline. Resting ballistocardiogram normal. Postexercise ballistocardiogram shows small "I" and "J" waves.

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13. Pordy, L.; Taymor, R. C.; Moser, M.; Chesky, K., and Master, A. M.: Clinical Evaluation of Ballistocardiogram: I. Normal Subjects, Am. Heart J. **42**: 321, 1951.
14. Chesky, K.; Moser, M.; Taymor, R. C.; Pordy, L., and Master, A. M:. Clinical Evaluation of Ballistocardiogram: II. Heart Disease—Hypertension, Angina Pectoris, and Myocardial Infarction, Am. Heart J. **42**: 328, 1951.

There were 75 patients with positive "two-step" tests, 50 men and 25 women. Sixteen of the group had positive single "two-step" tests, and the remainder had positive double "two-step" tests. The ages ranged from 29 to 73, with 24 patients under the age of 50. Fifty-eight patients had typical histories of heart disease, of whom 50 had angina pectoris, 5 had had previous episodes of coronary insufficiency, 2 had old myocardial infarctions, and 1 had luetic aortitis. Fourteen patients had atypical histories, 1 had a history suggestive of neurocirculatory asthenia, and 2 had entirely negative histories and physical examinations.

and 6 became abnormal. Seven of the 8 with abnormal resting ballistocardiograms had postexercise records taken, and all remained abnormal. One of the patients with a borderline ballistocardiogram had an abnormal record after exercise, the other two remaining unchanged. Of the 15 patients with abnormal ballistocardiograms, at rest or after exercise, 9 were 50 years of age or older.

B. With Atypical Histories: In this group there were five patients with normal and seven with abnormal ballistocardiograms at rest. After exercise, three of the former remained normal, and two became abnormal. All seven of those with abnormal resting records had ab-

TABLE 1.—*Patients with Negative "Two-Step" Tests*

					Exercise B C G							
		Resting B C G*			Resting B C G Normal		Resting B C G Abnormal		Resting B C G Borderline		Total	
Group	No.	N	A	B	N	A	N	A	A	B	Abnormal	Borderline
No symptoms	97	86	8	3	66	6	..	7	1	2	15	2
Atypical symptoms	12	5	7	..	3	2	..	7	..	..	9	..
Typical symptoms	4	1	3	..	..	..	1	2	..	..	3	..
Total	113	92	18	3	69	8	1	16	1	2	27	2

* N is Normal. A is Abnormal. B is Borderline. B C G is ballistocardiogram.

TABLE 2.—*Patients with Positive "Two-Step" Tests*

					Exercise B C G							
		Resting B C G*			Resting B C G Normal		Resting B C G Abnormal		Resting B C G Borderline		Total	
Group	No.	N	A	B	N	A	N	A	A	B	Abnormal	Borderline
Typical history	58	6	48	4	3	3	..	18	3	..	54	1
Atypical history	14	1	13	..	..	1	1	9	..	..	14	..
Neurocirculatory asthenia	1	1	..	..	1	..	..	..	..	..	..	..
No symptoms	2	1	1	..	..	1	..	1	..	..	2	..
Total	75	9	62	4	4	5	1	28	3	..	70	1

* N is Normal. A is Abnormal. B is Borderline. B C G is ballistocardiogram.

TABLE 3.—*Patients with Borderline "Two-Step" Tests*

					Exercise B C G							
		Resting B C G*			Resting B C G Normal		Resting B C G Abnormal		Resting B C G Borderline		Total	
Group	No.	N	A	B	A	B	A	B	A	B	Abnormal	Borderline
No symptoms	5	3	2	..	3	..	2	..	..	..	5	..
Atypical symptoms	1	1	..	..	..	1	..	..	..	..	..	1
Typical symptoms	1	..	..	1	..	..	..	..	1	..	1	..
Total	7	4	2	1	3	1	2	..	1	..	6	1

* N is Normal. A is Abnormal. B is Borderline. B C G is ballistocardiogram.

Six men and one woman had borderline double "two-step" tests. The age range was 38 to 54, with three patients under the age of 50. Five had normal histories, one an atypical history, and one a typical history of heart disease.

RESULTS

I. *Patients with Negative Double "Two-Step" Tests* (Table 1).—A. With Normal Histories: Of the 97 patients who were considered to be normal, 86 had normal ballistocardiograms while 8 had abnormal and 3 borderline ballistocardiograms at rest. Seventy-two of the patients with normal resting ballistocardiograms had records taken after exercise; 66 of these remained normal, normal exercise ballistocardiograms. Only two of the abnormal records obtained in this group were in patients under the age of 50.

C. With Typical Histories: One normal and three abnormal resting ballistocardiograms were obtained in this group. Exercise ballistocardiograms were obtained only in those with abnormal records. Of these, two remained abnormal, and one became normal after exercise. All three abnormal records were obtained in patients who were 50 years or older.

Of one hundred and thirteen patients with negative double "two-step" exercise electrocardiograms, 92 had normal resting ballistocardiograms. Eight out of 77 of

these became abnormal after exercise. Eighteen patients had abnormal resting ballistocardiograms, one of which normalized after exercise. Three showed borderline resting ballistocardiograms, and one of these became abnormal after exercise.

II. *Patients With Positive "Two-Step" Tests* (Table 2).—A. Typical Histories: There were 58 patients in this group. Six had normal resting ballistocardiograms. Forty-eight had abnormal records, and four were borderline. Three of the six patients with normal resting records had abnormal ballistocardiograms after exercise. Eighteen of those with abnormal records and three with borderline records had tracings taken after exercise, and all were abnormal. Thirty-six of the patients with abnormal ballistocardiograms, before and after exercise, were 50 years of age or older. Figure 3 illustrates a case with a positive double "two-step" test and an abnormal resting ballistocardiogram.

B. Atypical Histories: There were 14 patients in this group. One patient had a normal resting ballistocardiogram which became abnormal after exercise. Ten of the 13 with abnormal resting ballistocardiograms had records obtained after exercise, 9 remaining abnormal and 1 becoming normal. Only four of these patients were under the age of 50.

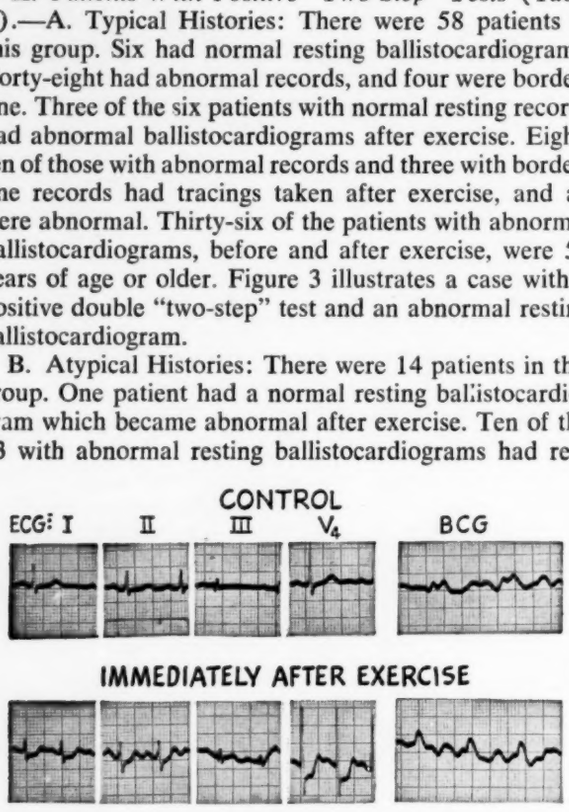

Fig. 3.—Records of M. F., aged 42, a male physician with angina pectoris. Electrocardiogram (12 leads) normal at rest. Control record shows electrocardiogram as normal and ballistocardiogram abnormal at rest. Record taken immediately after exercise shows S-T segment depressions (positive double "two-step" test) and ballistocardiogram still abnormal.

C. Neurocirculatory Asthenia: The one patient with neurocirculatory asthenia had a normal resting and exercise ballistocardiogram.

D. No Symptoms: There were two patients in this group, both over the age of 50. One had a normal and one had an abnormal ballistocardiogram at rest. Both were abnormal after exercise.

Of 75 patients with positive "two-step" exercise electrocardiograms, the resting ballistocardiogram was normal in 9, abnormal in 62, and borderline in 4. Five of the normal and three of the borderline cases became abnormal after exercise. One patient with an abnormal resting ballistocardiogram had a normal record after exercise.

III. *Patients With Borderline "Two-Step" Tests* (Table 3).—A. With Normal History: Three patients had normal resting ballistocardiograms all of which became abnormal after exercise. The two with abnormal resting tracings showed no change after exercise. Two of the abnormal records were in patients under the age of 50.

B. With Atypical History: The one patient in this group had a normal resting ballistocardiogram which became borderline after exercise.

C. With Typical History: This patient, age 42, had a borderline resting ballistocardiogram which became abnormal after exercise.

Of seven patients with borderline "two-step" exercise electrocardiograms, six had abnormal ballistocardiograms either before or after exercise.

COMMENT

Although we have compared the results of the ballistocardiogram with those of the electrocardiogram, it must be remembered that each measures different physiological processes of the heart. While the electrocardiogram is a reflection of the manner and course of the excitation wave through the myocardium, the ballistocardiogram results from the ejection of blood from the heart during systole. The movements of the body that are recorded are the recoils and impacts resulting from the flow of blood through the great vessels. The character of the ballistocardiographic waves depends largely on cardiac ejection velocity and force,[15] and no direct correlation between the results of electrocardiography and ballistocardiography should be expected. Pathological changes in the conduction pathways, or in the myocardium itself, may produce changes in the electrocardiogram. Even strategically placed small areas of damage may influence the electromotive field of the heart without altering mechanical cardiac function. Conversely, the mechanical function may be sufficiently impaired to produce changes in the ballistocardiogram without enough disturbances in myocardial excitation to alter the electrocardiogram. It is not unreasonable to assume that either one of these two physiological processes of the heart, mechanical or electrical, may be altered first in the very early phases of coronary artery disease. This difference of results is not confined to early heart disease and, although frank evidence of myocardial involvement may exist by physical examination or electrocardiogram, the heart may still produce a normal ejection force. This has been noted even after myocardial infarction.[16] The reserve of the heart may fall below normal only after exercise, and such a patient would show a normal ballistocardiogram at rest, but an abnormal postexercise record. Therefore, the taking of a record before and after standard exercise is necessary in the ballistocardiographic study of a patient, especially when the resting ballistocardiogram shows no abnormalities. In a small percentage of patients with definite evidence of coronary artery disease in this series, the ballistocardiogram remained normal even after sufficient exercise was given to produce electrocardiographic changes. At the present time, one can say no more than that such patients show no evidence of impairment of the systolic ejection force. Further study of these cases is required to determine whether or not this finding has any prognostic value.

15. Hamilton, W. F.; Dow, P., and Remington, J. W.: Relationship Between Cardiac Ejection Curve and Ballistocardiographic Forces, Am. J. Physiol. **144**: 557, 1945.

16. Moser, M.; Chesky, K.; Pordy, L.; Master, A. M., and Taymor, R. C.: Ballistocardiogram in Myocardial Infarction: Study of One Hundred Cases, to be published.

In the group of patients with negative double "two-step" tests, 27 were observed to have abnormal ballistocardiograms at rest or after exercise. This is indicative of abnormal cardiac ejection and, in the absence of extracardiac factors and valvular disease, suggests myocardial involvement. However, the age of the patient must be considered before ascertaining the significance of these findings. Table 4 indicates the incidence of abnormal ballistocardiograms in patients above and below the age of 50 in each group. Only in the group with negative "two-step" tests is there any marked difference of percentage of abnormal records in the two age groups. Although the number of patients in the younger age group is slightly higher, there is a 2: 1 preponderance of abnormal records in the older age group. Since the incidence of undetected coronary artery disease increases with age, this finding might be expected. However, the changes in cardiac ejection force producing an abnormal ballistocardiogram in the older age group may be a "physiological" process of aging and hold no prognostic import when other evidence of heart disease is lacking. In the younger age group, on the other hand, the abnormal ballistocardiogram is of more significance and probably indicates abnormal cardiac function due to impending clinical heart disease. Follow-up studies of all these patients will be necessary to ascertain the prognostic significance of the ballistocardiogram.

TABLE 4.—*Age of Patients with Abnormal Ballistocardiograms*

Group	Patients Under Age 50		Patients Age 50 and Older	
	No.	No. Abnormal	No.	No. Abnormal
Negative "two-step"	62	8	51	19
Positive "two-step"	24	22	51	48
Borderline "two-step"	3	3	4	3
Total	89	33	106	70

Over 90% of the patients with normal resting electrocardiograms, positive "two-step" tests, and diagnoses of organic heart disease had abnormal ballistocardiograms. This finding supports the value of the ballistocardiogram as a diagnostic tool in coronary artery disease. However, since almost 10% of these patients had normal records, even after exercise, a normal ballistocardiogram alone is not sufficient to rule out heart disease. The procedure should be combined with a careful history, physical examination, and other tests such as the electrocardiogram and "two-step" test. It should be pointed out that there is no evidence to indicate that either the ballistocardiogram or the "two-step" exercise electrocardiogram is superior to the other. In a few cases of coronary disease the ballistocardiogram was abnormal while the "two-step" test was negative; in others the reverse was true.

It is interesting to note that two patients with abnormal resting ballistocardiograms showed normal records after exercise. This has been observed by others,[11] but its significance is not clearly understood. It may be due to the ability of the heart, despite the presence of coronary artery disease, to improve its systolic ejection force with exercise. The vasodilatation of the peripheral vessels which accompanies exercise may exert an influence on the ballistocardiogram also to alter the pattern towards normal.

CONCLUSIONS

1. While the electrocardiogram is a measure of the electromotive field of the heart, the ballistocardiogram reflects the force and velocity of cardiac ejection. Since two entirely different processes are involved, it is not necessary to expect a 1: 1 correlation between the results of the electrocardiogram and the ballistocardiogram in heart disease, especially in the early pathological phases of heart disease.

2. Since, even in the presence of coronary artery disease, cardiac ejection force may be impaired only after exertion, the ballistocardiogram should be recorded after standard exercise if the resting record is normal.

3. The incidence of abnormal ballistocardiograms without other evidence of heart disease is greater in patients 50 years of age or older, but this may be associated with other "physiological" aging processes and not be of prognostic significance. In the younger age group, an abnormal ballistocardiogram probably is of greater significance in respect to abnormal cardiac function. Follow-up studies are required to ascertain the full meaning of such findings.

4. The ballistocardiogram was found to be abnormal in 93% of the patients with angina pectoris and will be a useful tool as an aid in the diagnosis of coronary artery disease, but it should be used in conjunction with a careful history, physical examination, and electrocardiographic studies.

SUMMARY

1. The ballistocardiographic findings in 195 cases are presented and correlated with results of the Master "two-step" exercise electrocardiogram. The ballistocardiograms were recorded by means of a modified Dock photoelectric instrument.

2. Twenty-seven patients (23%) of 113 with negative "two-step" electrocardiographic tests had abnormal ballistocardiograms either at rest or after standard exercise. Seventy (93%) of 75 with positive "two-step" tests had abnormal ballistocardiograms, and 6 out of 7 with borderline "two-step" tests had abnormal records.

3. The significance of an abnormal ballistocardiogram and the influence of age on the findings are discussed.

4. The ballistocardiogram is presented as a diagnostic aid in coronary artery disease.

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Differentiation of Mammary Duct Ectasia from Carcinoma.—The importance of the disease "mammary-duct ectasia" depends on the fact that it may present a clinical picture identical with carcinoma of the breast and betray the surgeon into doing an unnecessary radical mastectomy. . . . It is impossible to distinguish the two diseases by clinical examination. When mammary-duct ectasia has progressed to the stage in which inflammatory changes and consequent fibrosis have produced a tumor, the clinical picture may have all the features of carcinoma. The tumor is firm, poorly circumscribed, and, like a carcinoma, relatively fixed in the breast tissue that surrounds it. Retraction signs, including dimpling of the skin over the tumor, distortion of the contour of the breast, and retraction of the nipple, are regularly present. Axillary lymph nodes, enlarged as the result of inflammatory changes, are indistinguishable from lymph nodes containing metastasis.—C. D. Haagensen, M.D., Mammary-Duct Ectasia, *Cancer*, July, 1951.

FATAL INTERNAL INJURIES WITHOUT ASSOCIATED EXTERNAL MARKS

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In the investigation of deaths that have occurred unexpectedly and without reliable witnesses, autopsies not infrequently disclose cases in which unsuspected injuries were the proximal cause of death, even though there were no evidences of injury on the surface of the victim's body. Furthermore, the bodies of persons known to have died of traumatic injuries often bear insignificant or no external signs resulting from the fatal violence. It is probable that each year many unexpected or sudden deaths not due to natural causes are ascribed to such causes by coroners or attending physicians. Complete investigations, including medicolegal autopsies, doubtless would prove that the greatest proportion of these improperly certified fatalities were caused by injuries resulting from blunt force. Included in this group would be some instances in which beneficiaries had been deprived of insurance benefits because the traumatic nature of the death had not been recognized. In addition, a significant but inestimable number of homicides are undetected when inquiry is blighted by premature certification that death resulted from natural causes.

The importance of improving the accuracy of death certificates in cases of this type is obvious: justification of accident insurance claims would be established in some instances, public welfare would be protected by detection of homicides, and vital statistics would be rendered more accurate. The increased validity of vital statistics doubtless would be reflected most appreciably in two categories; i. e., the death rate from diseases of the cardiovascular system, to which most deaths of the kind being discussed are now attributed, would tend to diminish, while the number of deaths ascribed to accidents would increase. It is also likely that there would be some increase in the number of deaths established as having resulted from homicide and possibly from suicide. To exemplify and substantiate the previous statements, a few cases have been selected. In some instances the force had been applied to the head, in others to the chest, and in some to the abdomen. Occasionally, a death of the type under discussion results from violence to an extremity, and one case of that type is also included.

REPORT OF CASES

Deaths Due to Injuries of the Head. CASE 1.—Late one evening, a 36-year-old white man was heard arriving home, and shortly thereafter sounds from his room indicated that he was having difficulty in breathing. He was found to be in a coma, and within an hour after his distress was noted, he had a convulsion and died. A physician who was called stated that he believed the death had resulted either from natural causes or from acute alcoholism. Early the next morning, a man went to the police and stated that on the preceding evening he had knocked the dead man to the pavement during an altercation.

A medicolegal autopsy revealed a superficial abrasion of the skin over the lateral aspect of the right arm in an area 1.5 by 0.4 in. (3.8 by 1.0 cm.); there were no other external marks on the head or body. Reflection of the scalp revealed a fracture of the skull extending from the region of the right temple upward and backward for 4.5 in. (11.4 cm.), while another fracture extended upward and forward from the right temple for 2 in. (5.1 cm.). Removal of the calvarium disclosed 4 oz. (125 cc.) of partially clotted blood between the skull and the dura mater, so that the brain was severely compressed (Fig. 1). The cause of death was acute epidural hemorrhage resulting from fractures of the skull sustained when the head forcibly contacted a rounded or flat surface.

CASE 2.—A 26-year-old woman was observed to fall backward out of a swing, striking her head on a concrete surface. She was unconscious immediately after the blow and did not regain consciousness before she died two days later. When the exterior of the body was observed on the autopsy table, there was a small bruise on the inner surface of the left arm. No other marks were present on the surface of the body. Reflection of the scalp revealed hemorrhage in the tissues over the back of the head. A fracture of the skull extended from the top of the head downward and backward to the base of the skull. The brain showed extensive damage, especially in the regions of the frontal lobes, which were lacerated and hemorrhagic as a result of a contrecoup (Fig. 2). The cause of death was hemorrhages and lacerations of the brain and fracture of the skull, due to a fall from a swing.

Death Due to Injuries of the Chest. CASE 3.—A night watchman in a veneer mill was found dead one morning with several crates of veneer, each weighing approximately 200 lb. (91 kg.) lying over his body. The body was found in a part of the mill that was not on the watchman's prescribed route. As a part of the investigation, an autopsy was performed. The skin over the left upper arm and shoulder showed many minute bright red hemorrhagic petechiae. There were no other marks on the surface of the body, but palpation of the chest indicated that possibly some ribs were fractured. When the body was opened, it was found that six ribs on each side were fractured, with considerable associated intrathoracic hemorrhage. In addition, there were compression fractures of the first and fourth lumbar vertebrae and a fracture of the pelvis.

Compression fractures of the type found in this body result from hyperflexion of the trunk, and although officials of the veneer mill stated that the crates were piled in such a fashion that they would not accidentally fall on anyone, there can be little question that this death resulted from the fall of the crates. The possibilities that the watchman had accidentally pulled the crates over on himself in attempting to climb onto them, or even that they had been pushed on him, could not, of course, be excluded by the examination. The cause of death was bilateral hemothorax due to crushing injuries of the chest, fractures of two vertebrae, of several ribs, and of the pelvis.

Death Due to Injuries of the Abdomen. Case 4.—One morning a 60-year-old man was found dead in his bed. External examination of the body revealed no marks, and the skin over the abdomen was not bruised. When the abdomen was opened, nearly 2 qt. (2 liters) of blood were found in the peritoneal cavity, and a laceration almost completely divided the spleen into two equal fragments. The police determined that this man had been kicked in the abdomen during an altercation in a tavern on the evening before he was found dead. The cause of death was hemoperitoneum from a ruptured spleen, following blunt-force injury to the abdomen.

Death Due to Injuries of an Extremity. CASE 5.—A 37-year-old woman was struck in the thigh by the fender of an automobile. She had considerable pain in the leg and was not as active as usual for several days. On the fourth day after the injury, she complained of severe pain in the chest, and a few minutes later she died suddenly. Autopsy revealed a mass of clotted blood in the left femoral vein, and there was a moderate amount of hemorrhage in the muscle and fat immediately adjacent to this vein. In the right pulmonary artery was a coiled soft embolus (Fig. 3), which had broken loose from a thrombus in the

From the Coroner's Office of Hamilton County, Ohio, and the Kettering Laboratory in the Department of Preventive Medicine and Industrial Health, College of Medicine, University of Cincinnati.

vein of the left thigh. The cause of death was injury of the left leg, with resulting thrombosis of the left femoral vein and massive pulmonary embolism.

Incomplete perusal of the files from the Coroner's Office of Hamilton County has revealed that at least 11 additional traumatic deaths without significant external evidences have occurred during the last four years. One of these was due to a broken neck with associated injury of the spinal cord; this man had been found dying on a sidewalk, and the manner in which his injuries had been sustained was never determined. Three deaths were caused by chest injuries, including a fractured thoracic vertebra in one case, and these were believed to have resulted from "hit-and-skip" automobile accidents. One death followed a kick that ruptured the small intestine, and the others resulted from injuries of the head.

Fig. 1 (Case 1).—Clotted blood pressing on membranes over the brain. Injuries resulted when the head struck the pavement after a blow to the face.

COMMENT

All the deaths that have been discussed resulted from injuries caused by blunt force. Deaths from penetrating injuries, unaccompanied by obvious external marks, are also fairly common. Stab wounds of the head made by slender instruments, such as ice picks or knives with thin blades, often bleed little externally and may be unsuspected until the interior of the skull is examined. Wounds made by the entrance of bullets, particularly projectiles of small caliber, also may be unobserved, even during a careful examination of the scalp. In addition, bullets sometimes enter the body through one of its natural orifices and do not produce injuries of the exterior. In one such case a bullet entered the mouth of a screaming woman and first penetrated the tissues in the back of her throat. In this case it is notable that the bleeding from the mouth was ascribed to natural causes until an autopsy revealed the true cause of the hemorrhage.[1] Several cases have been observed by others [2] in which bullets entered the head through open eyes, and when the eyelids were closed there was no evidence of the gunshot wound. The bodies of pedestrians who have been killed when struck by motor vehicles frequently have few external marks to reflect severe internal injuries, a fact that must be responsible for nonrecognition of some unwitnessed "hit-and-skip" fatalities each year.

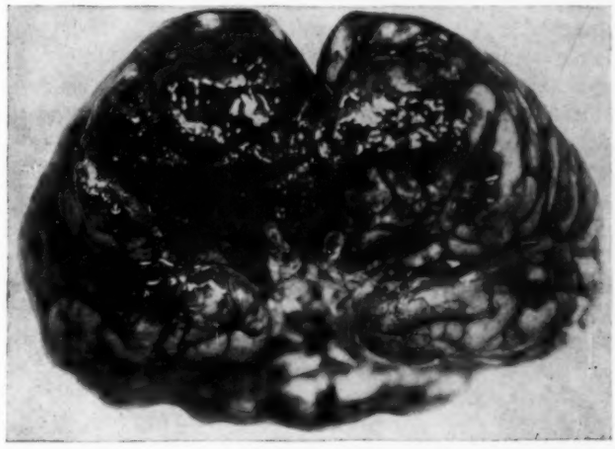

Fig. 2 (Case 2).—Contrecoup injuries of the frontal lobes of the brain, with hemorrhages and lacerations following a backward fall to a concrete surface.

When the surface of the body of a victim of traumatic death bears no signs of the fatal injuries, serious difficulty may be encountered in collecting insurance or workmen's compensation for accidental death. Such difficulties can usually be resolved unequivocally in favor of the beneficiary if an autopsy has been made. The possibility that fatal injuries may be sustained without associated external evidences of the injuries is recognized by life insurance companies. I have investigated deaths in cases in which no abnormalities were visible on the surface of the body, and in which the accident insurance policies contained, as a prerequisite to payment, a

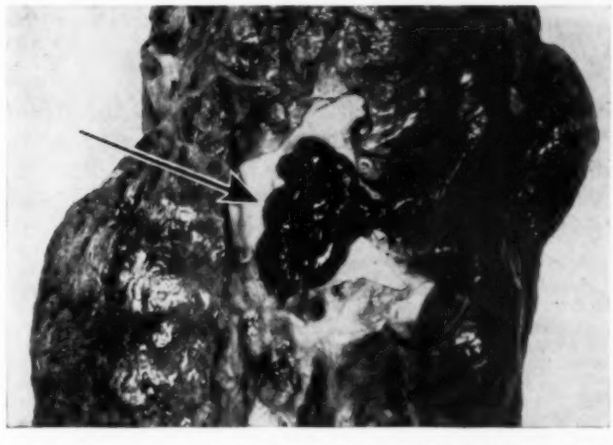

Fig. 3 (Case 5).—A coiled embolic mass in the right pulmonary artery. The thrombus had formed in the left femoral vein as a result of injury to the extremity.

clause to the effect that the exterior of the body must show evidences of the effects of violence. It is believed that a more rational restriction would require "external

1. Moritz, A. R., and Dutra, F. R.: Scientific Evidence in Cases of Injury by Gunfire, Arch. Path. **37**: 340-349 (May) 1944.
2. Helpern, M.: Postmortem Examination in Cases of Suspected Homicide, Ann. Int. Med. **24**: 666-700 (April) 1946.

marks from the trauma, or evidence of it as revealed by an autopsy."

Two of the five cases described in this paper were homicides. The traumatic nature of, and the criminal responsibility for, these two deaths could not have been established unless autopsies had been performed. It is impossible to estimate how many homicides by direct violence remain undiscovered in the United States each year. Doubtless, the number of such deaths varies considerably in different areas and is inversely related to the proportion and adequacy of the postmortem examinations made on bodies that come under the jurisdiction of the coroner or medical examiner. It has been recognized that a reasonably proper ratio of medicolegal autopsies to deaths that legally require autopsies in urban areas is 1 to 5; in rural areas, where there is greater likelihood of obtaining from neighbors and witnesses reliable facts relating to such deaths, the ratio may be as low as 1 to 10 with little likelihood of homicides remaining undiscovered.[3] There are few jurisdictions in this country in which these autopsy rates are even approximated.

SUMMARY

Deaths from injuries due to violence may occur without significant damage to the surface of the body. The traumatic nature of such deaths may be unsuspected by physicians and investigating officials. Failure to recognize that a death has resulted from trauma predisposes inequities of insurance settlements, inability to prosecute murderers, and inaccuracies in vital statistics. The number of traumatic deaths in which the factor of violence remains unrecognized can be diminished only by increasing the frequency of medicolegal autopsies throughout the country.

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3. Supplementary Report of Board of Trustees: Report of Committee to Study the Relationship of Medicine and Law, Organization Section, J. A. M. A. **125**: 577-583 (June 24) 1944.

THROMBOTIC OCCLUSION OF AORTA AS DEMONSTRATED BY TRANSLUMBAR AORTOGRAMS

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Translumbar aortography is a relatively recent addition to the procedures available in the diagnostic armamentarium. The method was first adequately described by the Spanish urologist, Dos Santos,[1] and it has been proved a valuable adjunct to the diagnosis of pathological renal conditions. Subsequent experience by urologists in this country [2] have led to perfections in the technique and to expansions in the usefulness of the method. Experience has also proved it to be a safe and uncomplicated procedure.

Application to the diagnosis of aortic vascular disease has lagged considerably behind the development of the procedure for the diagnosis of pathological renal conditions. Leriche [3] has referred in his discussion of thrombotic occlusion of the aorta to the arteriograms performed by Dos Santos. The first report, however, to appear in this country relative to the utilization of this method for the specific diagnosis of aortic disease appeared in 1947, when Price and Wagner [4] reported two cases of aortic thrombosis diagnosed antemortem by this means. These authors stated that to their knowledge no other cases of aortic occlusion had previously been diagnosed antemortem by aortography. Blakemore [5] mentioned one case in which he had produced occlusion during electrocoagulation of an aneurysm and subsequently confirmed it by an aortographic examination. In a more recent report [6] on the electrocoagulation method for treating aneurysms, he describes five cases which have been followed by translumbar aortographic examination to determine the effectiveness of this method for coagulation. Elkin [7] has reviewed the surgical treatment of insidious thrombosis of the aorta and includes among his report of 10 cases two cases diagnosed by aortographic examination. Boyd [8] has recently reviewed the literature on the subject of aortic thrombosis and reports two cases, one in which the diagnosis was suggested by retrograde aortographic examination. Farinas [9] reports another such case diagnosed by retrograde aortographic examination, but which was suggested more than proved because of the appearance of the collateral circulatory bed; the exact location of the obstructive process was not identified.

In Boyd's opinion the incidence of aortic thrombosis is "greater than the literature may indicate" (1.1% in 1,000 consecutive autopsies).[10] We are entirely in agreement with this statement and feel that the procedure of translumbar aortographic examination, if used much more frequently, would increase our accuracy of diagnosis and would thereby substantiate this opinion. It is our purpose here to describe the procedure and to report four cases of

From the Department of Medicine and Surgery, University of Colorado Medical Center.

1. Dos Santos, R.; Lamas, A., and Pereira Caldas, J.: Artériographie des membres et de l'aorte abdominale, Paris, Masson et Cie, 1931. Dos Santos, R.; Lamas, A., and Caldas: L'artériographie des membres, l'aorte et de ces branches abdominales, Bull. et mém. Soc. nat. de chir. **55**: 587, 1929.

2. Goodwin, W. E.; Scardino, P. L., and Scott, W. W.: Translumbar Aortic Puncture and Retrograde Catheterization of the Aorta in Aortography and Renal Aortography, Ann. Surg. **132**: 944, 1950. Evans, A. T.: Translumbar Arteriography: Preliminary Report, Cincinnati J. Med. **32**: 47, 1951. Smith, P. G.; Rush, T. W., and Evans, A. T.: An Evaluation of Translumbar Arteriography, J. Urol. **65**: 911, 1951. Nelson, O. A.: Arteriography of the Abdominal Organs by Aortic Injection: Preliminary Report, Surg., Gynec. & Obst. **74**: 655, 1942. Nelson, O. A.: Arteriography in Renal and Abdominal Conditions, J. Urol. **53**: 521, 1945. Doss, A. K.: Translumbar Aortography: Its Diagnostic Value in Urology, J. Urol. **55**: 594, 1946. Wagner, F. B., Jr.: Arteriography in Renal Diagnosis: A Preliminary Report and Critical Evaluation, J. Urol. **56**: 625, 1946.

3. Leriche, R., and Morel, A.: The Syndrome of Thrombotic Obliteration of the Aortic Bifurcation, Ann. Surg. **127**: 193, 1948.

4. Price, A. H., and Wagner, F. B., Jr.: Complete Occlusion of the Abdominal Aorta: Report of 2 Patients Diagnosed by Aortography, Surg., Gynec. & Obst. **84**: 619, 1947.

aortic thrombosis, which have been diagnosed by aortographic examination within the first six months in which we have been utilizing this diagnostic method.

METHOD

Translumbar aortographic examination is not a difficult technical procedure. The method has been described by Smith, Rush, and Evans,[11] and the equipment used by them is available. They utilize a 6 in., 18 gage needle, a 10 cc. Sana-Lok syringe, a plastic connector tube between the needle and syringe, and 12 cc. of 75% sodium iodomethamate (neo-iopax®).[12] The procedure is carried out in an x-ray room so that exposures may be made on a standard x-ray table equipped with a high speed Buckey grid. The exposure times range from 1/10 to 5/10 seconds with the kilovolt requirements adjusted for a density comparable to that of a routine flat x-ray of the abdomen. A standard 14 by 17 in. film is utilized with the patient in a face down position. The film should be so placed as to include the area between the 10th and 11th thoracic vertebra and the lower limits of the pelvis. This will include the bifurcation of the aorta and usually also the bifurcation of the iliac arteries. It is advisable to take a scout x-ray to insure proper positioning and to allow for any necessary correction in exposure technique.

The patient is anesthetized by the intravenous administration of thiopental (pentothal®) sodium. The needle is then introduced into the aorta in the following manner. A point is selected 8 cm. lateral to the spinous processes close to the inferior margin of the 12th left rib. The needle is advanced medially, superiorly, and anteriorly so as to impinge against the body of the 11th or 12th thoracic vertebra. It is then moved in a step-like fashion to a point where the tip just slips past the lateral margin of the vertebral body. The stylet is then removed, and the needle is advanced until it pierces the aorta. A definite "snap" will be felt when the wall of the aorta is punctured, and there will be a steady drip of blood from the needle, in contrast to the forceful flow with an arterial puncture. The syringe and tubing containing 12 cc. of 75% sodium iodomethamate is connected to the needle; pulsations should be noted in the plastic tubing. The rotary anodes of the x-ray machine are started, and the injection is made over a period of approximately three seconds. Film exposure is made while the last 1 to 2 cc. of contrast medium is being injected. The needle is then immediately withdrawn by a quick steady pull. Five seconds later a third x-ray, the so-called nephrogram, can be taken; this particular x-ray is of the utmost value in differentiating between a tumor and a cyst, but it is not necessary for observing abnormalities in any of the major arteries of the aorta. It is difficult to obtain this view without the presence of an automatic casette changer, but it can be done with very close teamwork among the x-ray technicians.

The patient can be returned to his bed as soon as the last exposure has been completed. Previous routines can be reinstituted as soon as he has recovered from the anesthesia. Morbidity with this procedure is no greater than that following lumbar puncture, except that some patients complain of a mild left shoulder pain, which is very transitory and usually easily controlled with acetylsalicylic acid (aspirin).

The technique described here was used in each of the cases reported below and has been the standard procedure for aortographic examination since its institution in this medical center.

REPORT OF CASES

CASE 1.—G. P., a white man, 62, was admitted to Denver General Hospital on Nov. 17, 1950, because of severe pain in both legs during the previous nine days and a sensation of paralysis, most marked in the left leg. Two years previously he had been hospitalized because of a similar episode, primarily with the right leg. He had had increasing intermittent claudication for 10 to 12 years, until he was able to walk only two blocks without resting. The immediate complaint started suddenly after exposure to a cold wind. The pain had become increasingly severer, and the left foot had started to turn blue.

Examination disclosed a temperature of 101 F., a pulse of 112, a respiration rate of 20, and a blood pressure of 105/70 in both arms. The heart, lungs, and abdomen were not remarkable. The

Fig. 1.—Aortogram in Case 1. Abrupt irregular termination of the contrast material over the area of L_3 and L_4 is characteristic of aortic occlusion; smaller collateral vessels below the level of the occlusion are typically filled.

patellar and ankle reflexes were weak, and superficial sensation in the legs and feet was decreased. The lower extremities were cold and slightly cyanotic. This was severer on the left, with an in-

5. Blakemore, A. H.: Angiography—An Evaluation of Its Usefulness, S. Clin. North America **26**: 326, 1946.

6. Blakemore, A. H.: Progressive Constrictive Occlusion of the Abdominal Aorta with Wiring and Electrothermic Coagulation: A One Stage Operation for Arteriosclerotic Aneurysms of the Abdominal Aorta, Ann. Surg. **133**: 447, 1951.

7. Elkin, D. C., and Cooper, F. W., Jr.: Surgical Treatment of Insidious Thrombosis of the Aorta: Report of 10 Cases, Ann. Surg. **130**: 417, 1949.

8. Boyd, W. M.: Thrombosis of the Terminal Aorta with Aortitis and Periaortitis: Report of 2 Cases Treated by Aortectomy, Lumbar Sympathectomy, and Vena Caval Ligation, Rocky Mountain M. J. **47**: 936, 1950.

9. Farinas, P. L.: Retrograde Abdominal Aortography, Am. J. Roentgenol. **55**: 448, 1946. Farinas, P. L.: Retrograde Aortography in the Study of the Abdominal Aorta and Iliac Arteries, Surgery **18**: 244, 1945.

10. Cleland, J. B.: Occlusion of the Abdominal Aorta by Ante-Mortem Thrombosis, M. J. Australia **2**: 359, 1944.

11. Smith, P. G.; Rush, T. W., and Evans, A. T.: Interpretation of Translumbar Arteriograms, J. Urol. **66**: 145, 1951.

12. The sodium iodomethamate used in this study was supplied by Schering Corporation, Bloomfield, N. J.

definite line of demarcation 10 cm. proximal to the malleoli. Both legs were tender and painful on motion. Dorsalis pedis and posterior tibial pulsations could not be felt in either leg; popliteal and femoral pulsations were present in the right leg but absent in the left.

Shortly after admission a left paravertebral block was performed, which resulted in slight elevation in the temperature of the left foot. In spite of daily blocks for the next three days, the demarcated zone became more pronounced. On Nov. 21, 1950, a translumbar aortogram (Fig. 1) revealed an abrupt irregular termination of the contrast material 6 cm. proximal to the bifurcation of the aorta—consistent with a thrombosis. The patient refused amputation of the gangrenous extremity and left the hospital against advice. On Dec. 12, 1950, he was readmitted with signs of progressive arterial insufficiency in both legs and superficial ulcerations of the left foot. Chemotherapy was instituted, and the left lower extremity was packed in ice. Three days later, under spinal anesthesia, a midthigh amputation was attempted, but the patient suddenly became cyanotic, complained of chest pain, and died. Autopsy revealed a massive pulmonary embolus. The aorta (Fig. 2) was almost totally occluded by a well-organized thrombus, which was attached to a small arteriosclerotic plaque.

CASE 2.—M. B., a white housewife, 54, was admitted to Colorado General Hospital on Dec. 26, 1950, complaining of blue discoloration of the toes of the right foot. The previous two months she had noted severe exertional pain with intermittent numbness in her legs, which was relieved by resting. The toes of her right foot had gradually turned blue and were quite painful. The latter complaint seemed to be aggravated by bed rest and necessitated nocturnal ambulation for relief.

Examination disclosed a temperature of 98 F, a pulse of 96, a respiration rate of 18, and a blood pressure of 140/94 in the upper and 0/0 in the lower extremities. The heart was slightly enlarged, and the electrocardiogram indicated slight left ventricular strain. The lungs were clear to auscultation and percussion. The liver was palpated 3 cm. below the right costal margin. Pulsations of the abdominal aorta were palpable in the epigastrium; femoral pulsations were debatable; popliteal, posterior tibial, and dorsalis pedis pulsations were absent. Slight nonpitting edema of the lower extremities and dark purple painful discoloration of the toes and dorsum of the right foot were present. The temperature was grossly equal in both lower extremities. Reflexes and sensations were normal. X-ray showed calcifications of the aortic arch and the abdominal aorta.

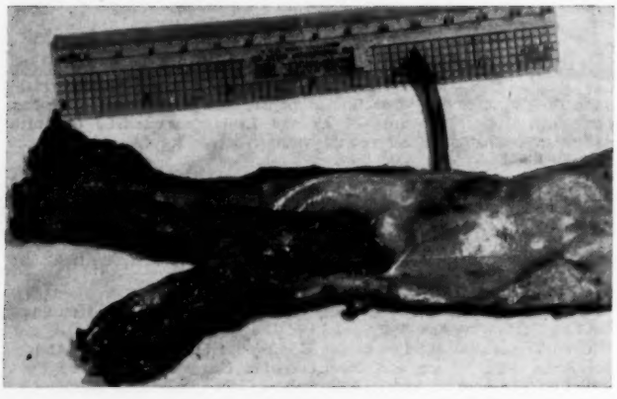

Fig. 2.—Postmortem finding in Case 1 of a well-organized thrombus in the terminal aorta with propagations into both iliac arteries. The irregular superior margin corresponds to the margins noted in the aortogram. Note the large inferior mesenteric artery projecting to the left.

A caudal block afforded prompt relief of pain in the left foot. The next day continuous caudal block was instituted, but the second toe of the right foot remained blue and cold. An attempt was made to inject 0.3 mg. of CCK (dihydroergocornine, dihydroergocristine, dihydroergokryptine ["hydergine"]) into the right femoral artery, but the lumen was difficult to locate. A diagnosis of occlusion of the femoral or iliac arteries was made. The patient was maintained on a course of CCK administered orally. This regimen relieved her pain considerably. On Jan. 12, 1951, a translumbar aortogram (Fig. 3) revealed an abrupt transverse termination of the contrast material just distal to the orifices of the renal arteries. On Jan. 19, 1951, the evening before contemplated abdominal sympathectomy, a left pleuritic pain suddenly developed, which was diagnosed as pulmonary embolism with infarction. Under anticoagulant therapy she recovered. On Jan. 29, 1951, she had a bilateral lumbar sympathectomy, ligation of the inferior vena cava, and "aortic stripping." Palpation of the aorta at the site of the thrombosis gave the impression that some blood might be getting past the thrombus. Aortic transsection was not, therefore, done. On March 21, 1951, the gangrenous left second toe was amputated. After these procedures the symptoms due to the aortic thrombosis were relieved to the point that ambulation and limited activity were possible.

Fig. 3.—Aortogram in Case 2 revealing an abrupt transverse termination of the contrast material just distal to the well-visualized renal arteries. Note tortuous intercostal arteries with anastomotic branches. The superior mesenteric artery, arising just proximal to the renal arteries, shows filling of its tributaries in the pelvic area well below the termination of the contrast material in the aorta.

CASE 3.—F. A., a white man, 46, with known diabetes since 1945, was admitted to Fitzsimons General Hospital on Nov. 27, 1950, for regulation of his diabetes.[13] He complained of aching pain and weakness in his thigh muscles, aggravated by exercise and characteristically relieved by resting a few moments. These symptoms had begun two years before, at which time a routine examination had revealed palpable femoral, posterior tibial, and dorsalis pedis pulsations. A 2,300 calorie diet and 25 units of protamine zinc insulin and 50 units of regular insulin daily were prescribed. In mid-December he was discharged from the hospital. It was recommended that he return in one or two months for reevaluation of the vascular status of his lower extremities. He was therefore readmitted on Feb. 15, 1951, with the complaint that his exercise tolerance was much decreased and that the pains in his thighs were worse. Questioning revealed that he was unable to obtain an erection with sexual stimulation.

13. Col. L. C. Goyette and Col. James Forsee, of Fitzsimons Hospital, gave their permission to include this report.

Physical findings on examination were noncontributory except for absent femoral, popliteal, posterior tibial, and dorsalis pedis pulsations bilaterally. The patient's diabetes was well controlled.

On Feb. 28, 1951, a translumbar aortogram (Fig. 4) revealed a thrombotic occlusion of the aorta extending from approximately 1 cm. distal to the origin of the right renal artery to about 4 cm. distal to the origin of the left renal artery. Sympathetic block on the right produced a marked increase in exercise tolerance for both legs. Anticoagulant therapy was immediately instituted. On March 6, 1951, a right lumbar sympathectomy was performed with the removal of the second and third lumbar ganglia. Temperature studies before and after this procedure revealed an increase in the temperature of the right foot and leg. April 5, 1951, a left lumbar sympathectomy was performed, and similar objective as well as subjective improvement was noted.

Case 4.—W. W., a retired rancher, 70, was admitted to Colorado General Hospital on May 14, 1951, after hospitalization at Colorado Psychopathic Hospital for a toxic psychosis thought to be due to meperidine (demerol®). He had been fairly well until May 6, 1951, when he collapsed because his legs "gave out from under him." Four days later a sudden onset of severe cramping nonradiating epigastric pain developed, which was relieved by meperidine. The next day he complained of pain in both hips and had another episode of epigastric distress; he became ashen, and abdominal distention developed. He refused hospitalization adamantly so was again administered meperidine, with relief of pain. Shortly afterward he began having visual hallucinations, became violent, and required commitment. Past history revealed that he had suffered from "rheumatism"

Fig. 4.—Aortogram in Case 3 showing the aorta to be completely filled with contrast material to the level of the left renal artery. A thrombus occludes approximately one-half the lumen from this site to the level of L_1, where there is an abrupt termination of the contrast material. The superior mesenteric artery is visualized just to the left of the aorta with its branches well-filled below the level of the occlusion. A nephrogram is obtained with this exposure, since the time lapse from injection was ½ second.

of his legs for 20 years. The past four months he had been unable to walk more than one-half block without resting, in order to obtain relief from pain in the calves of both legs. On admission he was found to experience severe pain in both legs when standing.

Examination disclosed a temperature of 98.6 F, a pulse of 84, a respiration rate of 20, and a blood pressure of 130/80 in the upper and 0/0 in the lower extremities. The lungs were clear to auscultation and percussion. The heart was not enlarged; there were occasional extra systoles but no murmurs; the electrocardiogram showed slight left ventricular strain and premature ventricular contractions. The abdomen was slightly rounded, without tenderness, spasm, masses, or palpable organs. Aortic pulsations were not felt; femoral, popliteal, posterior tibial, and dorsalis pedis pulsations were absent bilaterally. The

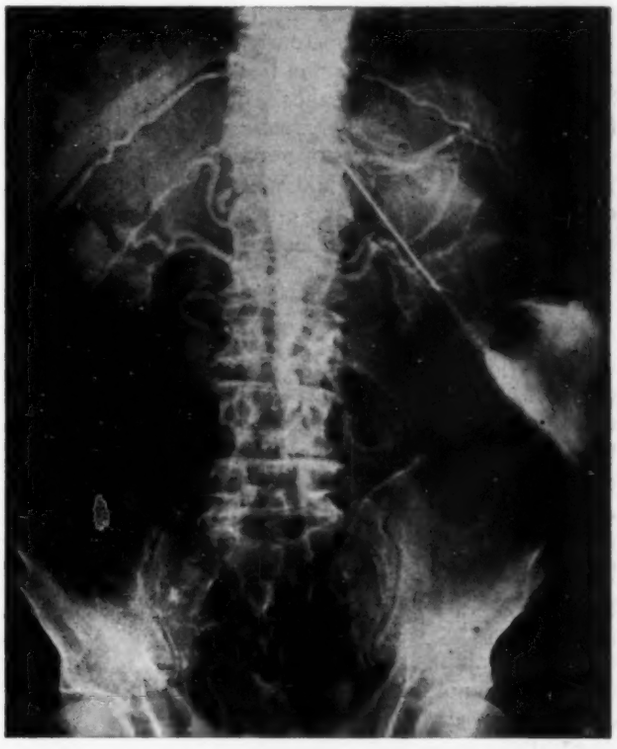

Fig. 5.—Aortogram in Case 4. The contrast material follows much the same pattern as in Case 3 (Fig. 4). There is, however, a more irregular outline to the thrombus. The renal arteries are clearly visualized and also the extensive collateral anastomoses through the intercostal arteries.

lower extremities had a full range of motion, blanched slightly with elevation, and became red when dependent. There was a slight decrease in the skin temperature of both feet and legs. The reflexes were normal, but there was diminished pain sensation over the distal half of the right tibial region, the right ankle, and the dorsum of the right foot. The chest x-ray showed normal condition; a flat x-ray of the abdomen revealed a linear density compatible with a diagnosis of calcification in the left common iliac artery.

On May 15, 1951, a translumbar aortogram (Fig. 5) revealed the characteristic findings of a thrombotic aortic occlusion. The patient was transferred to the surgical service on May 16, 1951, for operative therapy.

COMMENT

Thrombotic occlusion of the aorta is not a recently recognized disease entity. Graham,[14] in 1814, made an attempt to differentiate between embolic occlusion and thrombotic occlusion of the terminal aorta. His work was referred to by Welch,[15] who in 1898 gave a classical description of this pathological process and collected all the then reported cases of thrombosis and embolism of the terminal aorta. Fourteen of these cases were believed

14. Graham, R., cited by Welch, W. H.: Embolism and Thrombosis of the Abdominal Aorta, in Alibutt, C., and Roleston, H. D.: System of Medicine, London, Macmillan & Co., Ltd., 1909.

15. Welch, W. H.: Embolism and Thrombosis of the Abdominal Aorta, in Allbutt, C., and Roleston, H. D: System of Medicine, London, Macmillan & Co., Ltd., 1909, vol. 6, p. 809.

to be thrombotic in origin, of which seven were considered primary. In 1923 Leriche [16] reported again on the entity of thrombotic occlusion. His interest in this particular disease continued uninterruptedly, and by 1940 [17] he was able to describe a symptom complex and five cases diagnosed and substantiated at surgery. Greenfield [18] in 1943 again reviewed the literature, finding 156 cases of thrombosis and embolism of the abdominal aorta. Holden [19] in 1946 was apparently the first to report the successful surgical treatment of this disease in the United States. The problem of diagnosis, however, continued to be a deterrent to our comprehension and therapy of this disease process. The key to overcoming this difficulty was given in a report by Price and Wagner [4] on the accuracy of diagnosis by utilizing the procedure of aortographic examination in studying suspected cases of aortic thrombosis.

Leriche and Morel in 1948 [20] brought up to date information on this disease process in an article reviewing the clinical aspects, the diagnosis, and the treatment. They emphasize the clinical symptoms of weariness and fatigue of both lower extremities, usually associated with a global atrophy of both lower limbs without the presence of trophic changes. There is a pallor of the legs and feet even on standing. In the men there is, in addition, the inability to maintain a stable erection, the explanation being that the blood flow is insufficient to fill the spongious process. Clinical investigation will reveal that no pulse is palpable in either leg or in either groin. Pulsations in the abdominal aorta may, however, be felt high up above the umbilicus. Such findings usually mean one of three things; (1) coarctation of the aorta, (2) abdominal aneurysm, or (3) thrombotic obliteration of the aorta. A positive diagnosis, particularly in the case of thrombotic obliteration of the aorta, can only be established by translumbar aortographic examination. In addition, with this procedure the exact location of the lesion can be identified. Moreover, it is possible to misinterpret an occlusive peripheral vascular disease with this particular process in the abdominal aorta. We have on one occasion examined a patient who had the classical clinical picture of aortic thrombosis, but the aortogram did not support this impression.

The value of making an accurate diagnosis is extremely important to the welfare of the patient because it affects the therapy which is instituted. Conservative or medical management, or operative sympathectomy alone, does not constitute adequate treatment for the patient with aortic occlusion, as it might for the patient with peripheral vascular disease in which the obliterative process is associated with a superimposed reflex vasospasm. Leriche [3] emphasized the significance of resection of the segment of aorta containing the thrombotic process as an additional means of interrupting the sympathetic outflow to the lower extremity. Elkin [7] also emphasized that such resection removes the thrombus and prevents the continuation of its formation. It has been shown that death may occur from proximal propagation of the thrombus to the point at which the renal arteries are involved. Aortographic examination is of benefit in determining, preoperatively, whether resection of the aorta is feasible or not. An advantage of the translumbar approach, in contrast to retrograde aortographic examination, as described by Farinas, is its ability to accurately delineate the upper margin of the thrombus.

The frequency with which aortic thrombosis is associated with thrombophlebitis and subsequent pulmonary embolus has recently been referred to by Boyd.[8] He mentions similar observations by Leriche and Martorell and recommends that vena caval ligation be performed as an adjunct to surgical therapy. In the absence of accurate diagnosis such ligation is not only contraindicated but might also be definitely harmful.

Translumbar aortographic examination is a satisfactory and uncomplicated procedure for the diagnosis of aortic disease. No difficulties are known to have resulted when it has been used properly. It has been argued that in patients with aortic occlusion the injected dye might lead to spasm of the collateral circulatory bed and thereby impair the remaining circulation to the lower extremities. This has not been observed in our experience in any instance, and any spasm that might possibly occur as a result of injection of a water soluble dye, such as iodomethamate, is transitory in nature and not an important consideration. The value of accurate diagnosis is of far greater significance than the possibility that such spasm might occur during the diagnostic procedure. Also it should be pointed out that if there is undue fear of the consequences of this localized collateral spasm, it might be overcome by a preliminary injection of procaine into the aorta or by injection of the ergot alkaloid preparation CCK, which has been shown to relieve the spasm of peripheral arterial disease.[21]

The fear of damage or hemorrhage from the introduction of a needle into an arteriosclerotic aorta for aortographic examination has not been borne out by the previous experiences of others or by our own observations. Autopsy in our first case failed to reveal any evidence of hemorrhage in the area of the puncture site, and, in fact, the site itself could hardly be identified.

It is concluded, therefore, that aortographic examination should be utilized in patients showing evidence of a high obstruction of the arterial blood supply to the lower extremities. It would seem that if physicians are on the look-out for this particular disease entity, it will be found much more frequently than has been the case in the past. Translumbar aortographic examination is felt to be a significant and practical adjunct to the diagnosis of aortic disease, and its use will considerably broaden the understanding of these pathological processes.

16. Leriche, R.: Des oblitérations artérielles hautes (oblitération de la terminaison de l'aorte) comme cause des insuffisances circulatoires des membres inférieurs, Bull. et mém. Soc. nat. de Chir. **49**: 1404, 1923.

17. Leriche, R.: De la résection du carrefour aortico-iliaque avec double sympathectomie lombaire pour thrombose artéritique de l'aorte: Le syndrome de l'oblitération termino-aortique par artérite, Presse méd. **48**: 601, 1940.

18. Greenfield, I.: Thrombosis and Embolism of the Abdominal Aorta, Ann. Int. Med. **19**: 656, 1943.

19. Holden, W. D.: Arteriosclerosis Obliterans of the Abdominal Aorta, Arch. Surg. **53**: 456 (Oct.) 1946.

20. Leriche, R., and Bertrand, I.: Thromboses artérielles: Physiologie, pathologique et traitement chirurgical, Paris, Masson & Cie, 1946. Leriche and Morel.[2]

21. Anderson, L.: Personal communication to the authors. Hurley, L. A.; Roberts, J. E.; Buchanan, A. H., and Tillquist, G.: Preliminary Investigation of the Value of the Dihydrogenated Alkaloids of Ergot in the Treatment of Experimental Frostbite, Surg., Gynec. & Obst. **92**: 303, 1951.

SUMMARY

The subject of diagnosis of aortic thrombosis is reviewed. Four cases diagnosed antemortem by translumbar aortographic examination are reported. We know of only four such cases previously reported in the English literature. Experience in these cases would suggest that this disease process occurs more frequently than is generally recognized. The use of aortographic examination in suspected cases is of great value in establishing the diagnosis of aortic occlusion and in planning operative therapy. The procedure of translumbar aortographic examination is described. It is felt that this procedure does not carry any undue risk when used in patients with aortic disease.

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TRUE HERMAPHRODITISM

John I. Brewer, M.D., Harold O. Jones, M.D.
and
Harry Culver, M.D., Chicago

The term true hermaphrodite is used to indicate that the person is bisexual in both the gonadal and secondary sex structures. A true hermaphrodite, in the classic sense [1] should be able to fertilize a female, be fertilized by a male, and fertilize itself; but no such instance is authoritatively reported in the literature. The term pseudohermaphrodite indicates that the person has gonads of one sex and is bisexual in the secondary sex structures.

Hinman [2] has classified true hermaphrodites concisely as follows: (1) bilateral: testis and ovary (ovotestis) on each side, (2) unilateral: ovotestis on one side with ovary or testis on the other side, and (3) lateral or alternating: testis on one side and ovary on the other side. The patient reported here is a true hermaphrodite of the unilateral type, according to Hinman's classification. The extreme rarity of proved instances of true hermaphroditism and the widely divergent treatment of this condition as well as that of pseudohermaphroditism warrants the presentation of a single case. Arey [3] recently has made an exhaustive study and analysis of cases of true hermaphroditism as reported in the world literature.

REPORT OF A CASE

The patient, a Negro woman aged 18, was admitted to St. Luke's Hospital on June 22, 1939. The following history was obtained from the patient, her mother, previous hospital and out-patient records, and the office of the county clerk. The records of the hospital show the patient to have been born June 9, 1920, and to have been registered as a male at the time of birth. The certification of birth recorded at the office of the county clerk on July 7, 1920, certifies that the patient, of the male sex, was born on the above date. The name as listed reveals the existence of some confusion in regard to the sex. The mother would not accept the obstetrician's statement that her child was a boy and immediately upon leaving the hospital began to raise the infant as a girl.

Early in her life the patient was told by her mother that she was different from other boys and girls and that she should not let others see her genitalia. During childhood she was known as a tomboy and enjoyed playing baseball and other games with boys. In high school she was popular with both girls and boys, believed herself to be entirely feminine, went to dances with boys, and partook of their kisses and caresses with pleasure. She feared the possibility of their finding out about her and realized that she could not marry and live in normal relationship with a husband. The desire to be married was the factor that caused her to seek medical assistance at the age of 18. Her physical appearance, excluding the external genitalia, was such that she was accepted as a girl by all her friends. She had never menstruated, and there had never been any cyclic pain or other symptoms suggestive of a hematometra or hematocolpos. Upon questioning, the patient stated emphatically that she was a female but that she was deformed.

Physical Examination.—The patient had the external body build of a well-developed female (Fig. 1), although the shoulders were square and the hips narrow. She was of normal height and weight. The hair distribution was distinctly feminine. The breasts were of moderate size, were well formed and contained breast

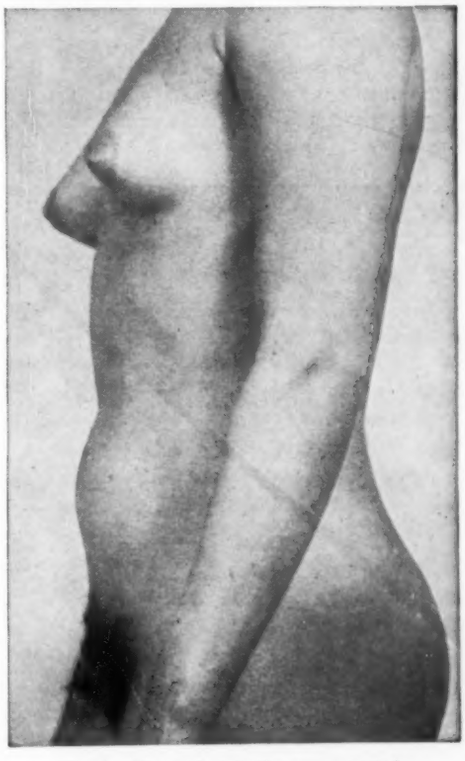

Fig. 1.—The patient in the case reported.

tissue. A phallus-like structure was 4 cm. long and 2.4 cm. in diameter (Fig. 2). The urethral orifice opened in the midline some distance from the base of the phallus. There were large

From the Departments of Gynecology, Obstetrics, and Urology, and the Henry Baird Favill Laboratory, St. Luke's Hospital, and Northwestern University Medical School. Dr. Brewer is now at Passavant Memorial Hospital.

1. Young, H. H.: Genital Abnormalities, Hermaphroditism and Related Adrenal Diseases, Baltimore, Williams and Wilkins Company, 1937.
2. Hinman, F.: The Principles and Practice of Urology, Philadelphia, W. B. Saunders Company, 1935.
3. Arey, L. B.: True Hermaphroditism, to be published.

labia majora, no labia minora, and no vaginal opening on the perineum. No gonads were palpable in the inguinal region or in the labia-like structures. On rectal examination the presence of a uterus was suggested by a small mass located in the midline. Lateral to this structure normal-sized gonads were palpated.

Cystoscopic Examination.—There was an opening on the floor of the urethra at the junction of the middle and distal thirds. The cystoscope was introduced through this opening into a canal whose walls had rugae similar to those of a vagina. No cervix was seen. A retrograde pyelogram was normal. A cystogram showed a normal bladder, and the opaque material that had filled the vaginal tract demonstrated the connection between the urethra and the imperforate vagina.

Physical Diagnosis.—The diagnosis made at that time was (1) pseudohermaphrodite (female), probable, (2) congenital malformation of the vagina, (3) hypertrophied clitoris, and (4) questionable presence of a uterus. Since we believe then that all patients, irrespective of their age, who were of questionable sex should have the diagnosis proved before reconstructing the external sex structures, an abdominal exploration was done.

Operative Findings and Procedure.—The uterus, 0.6 cm. in diameter, was a cord-like, noncanalized structure in the midline. No cervix was identified. The fallopian tubes were small, incompletely canalized, and united in the midline at the superior end of the uterine-like structure. Both ovaries were normal in size and appeared normal grossly. Each ovary was bisected. The left contained a corpus luteum 2 cm. in diameter with a hemorrhagic rupture point. There was some blood-tinged fluid free in the pelvic cavity. A biopsy of the ovary was taken. The right ovary contained an old organized corpus luteum, several follicles, and, at one pole, a region of tan stringy tissue 1 cm. in diameter, which grossly resembled testicular tissue. This and some adjacent ovarian tissues were excised. The kidneys and adrenal glands were normal on palpation. An operative diagnosis

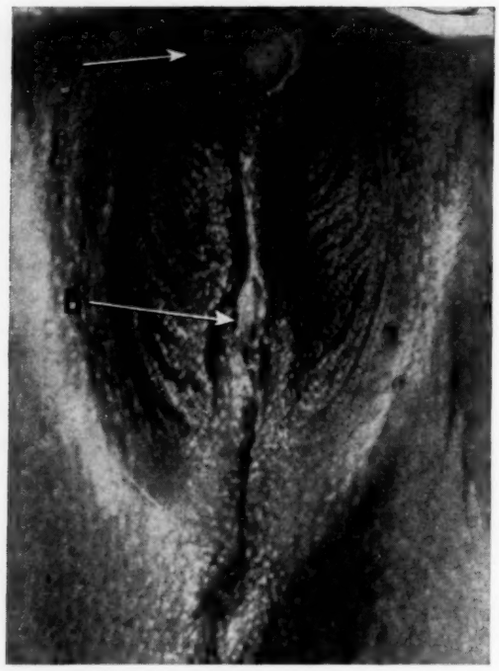

Fig. 2.—The phallus-like structure, *A* is 4 cm. long. The urethral orifice, *B*, is in the midline, some distance from the base of the phallus. Labial folds are present. There is no vaginal opening on the perineum.

of a unilateral ovotestis, with predominance of ovarian tissue, and a normal ovary on the opposite side was made. The abdomen was closed, and the hypertrophied clitoris was amputated.

Two weeks later an external opening of the vagina was constructed by simple transverse incision of the perineal body. The upper portion of the vagina was a simple pouch. The opening between the urethra and the vagina was closed. The diameter of the vaginal canal was maintained by use of a plastic mould.

Histological Findings.—The left ovary was composed of normal ova, follicles, and stroma. The corpus luteum was normal and young (Fig. 3). The granulosa-lutein layer was traversed by

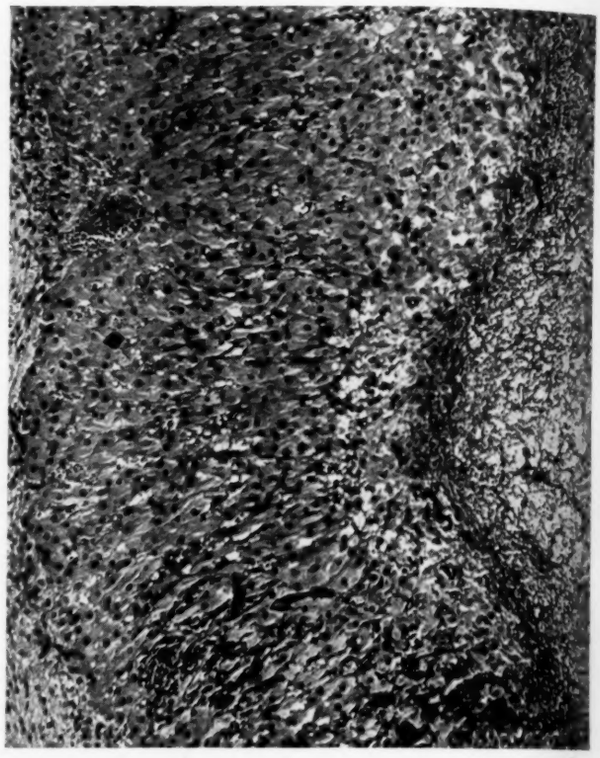

Fig. 3.—Photomicrograph of a portion of the grossly yellow wall of the corpus luteum, which is in the early vascularization stage.

small blood vessels and strands of connective tissue. The theca lutein cells were arranged about the periphery in the usual manner.

Sections of the right gonad had normal ovarian stroma, ova, and follicles (Fig. 4). Adjacent to these normal structures in the ovarian cortex there was a small, localized mass of tissue composed of testicular elements (Fig. 4*F*). The elements consisted of abundant interstitial cells that appeared normal and tubular-like structures that contained spermatogonia and Sertoli cells (Fig. 5). There was no spermatogenesis.

Clinical and Pathologic Diagnoses.—The clinical and pathologic diagnoses were

(1) true hermaphroditism (unilateral) with feminine desires and emotions (right ovotestis and normal left ovary); (2) congenital malformation of the uterus, fallopian tubes, vulva, vagina, and urethra; and (3) hypertrophy of the clitoris.

One year after surgical treatment the patient was married and described normal sexual experiences and pleasure.

COMMENT

Occasionally a physician must make a decision concerning the sex of an infant at birth. Similar decisions may be required with respect to a few patients even after they are adults. Most of these patients are pseudohermaphrodites, but a few are true hermaphrodites. It is imperative that the genetic sex be established early in life before strong sexual desires and emotions (psychological sex) have developed. As a general rule these young patients are best cared for if they are raised from infancy in accordance with the genetic sex or, in case of

a true hermaphrodite, in accordance with the predominant genetic sex.

While the patient reported here is a true hermaphrodite, it is impossible to discuss the clinical diagnosis and management of hermaphroditism without including various aspects of pseudohermaphroditism. In both, the external genitalia are admixtures of male and female elements. There is usually a phallus-like structure with a hypospadiac urethral opening. A vagina may or may not be present. When present it may open on the perineum or into the urethra or it may end blindly. Labia majora or scrotal-like structures are usually evident. The gonads may be located in these scrotal structures, in the inguinal canal, or in the abdomen. The internal Müllerian derivatives, if existent, usually have various degrees of malformation; rarely are they entirely normal.

The diagnosis of the genetic sex of these persons cannot be made by inspection of the external genitalia. For absolute accuracy, microscopic examination of the gonads is usually necessary. Inspection of the surface of the gonad is not sufficient. Young [1] records an instance in which, on gross examination, a gonad was thought to be an ovary, but when microscopic sections were studied the organ was found to contain only testicular tissue. Failure to bisect the glands and take a biopsy for microscopic examination may result in misjudgment in both diagnosis and treatment. An example of such an instance was presented by Engle, Yeaw, and Lattimer [4] in their supplementary report of a true hermaphrodite previously described by them.[5] When first seen at 11 years of age, the patient had two gonads on the right side, one of which, upon gross inspection of its outer surface, was thought to be an ovotestis. On the left there was an apparently normal ovary. Since it was decided that the sex was male, the authors removed the normal left ovary, the right ovotestes, and all Müllerian structures, leaving in place the gonad that they thought to be a testis. In the supplementary report they described the patient at 14 years of age. Definite feminine changes had taken place, and it was obvious that the basic genetic sex was female. With the idea of removing any testicular hormonal influence, the remaining gonad was removed surgically. Microscopic examination revealed it to be an ovotestis with good follicular ovarian elements.

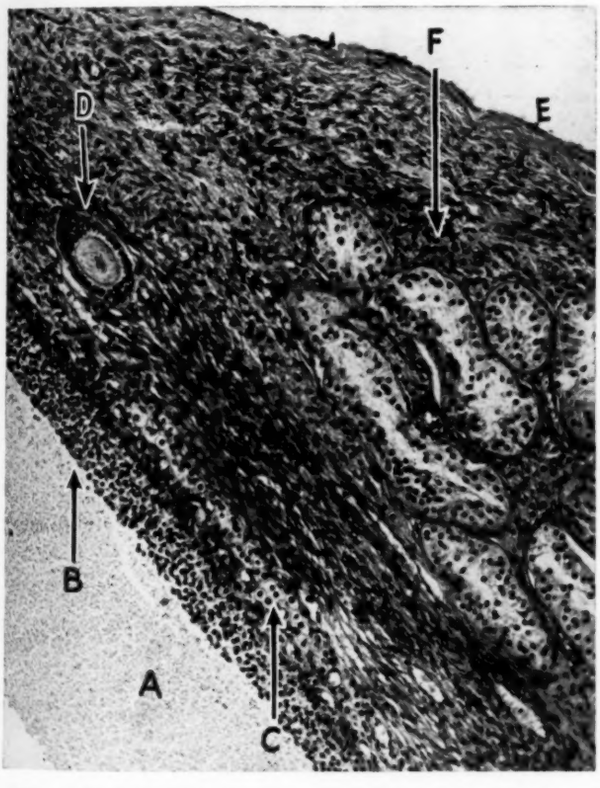

Fig. 4.—Photomicrograph of tissue resected from right intra-abdominal gonad. The maturing Graafian follicle has a normal central cavity, *A;* a normal granulosa cell border, *B;* and a normal peripheral theca cell layer, *C*. Adjacent to it is a normal Graafian follicle, *D*, in the early stages of growth, with an intact ovum. The germinal epithelium, *E*, on the surface of the ovary, is intact in most portions of the sections. In the ovarian cortex there are testicular tubules surrounded by interstitial cells, *F* (see fig. 5).

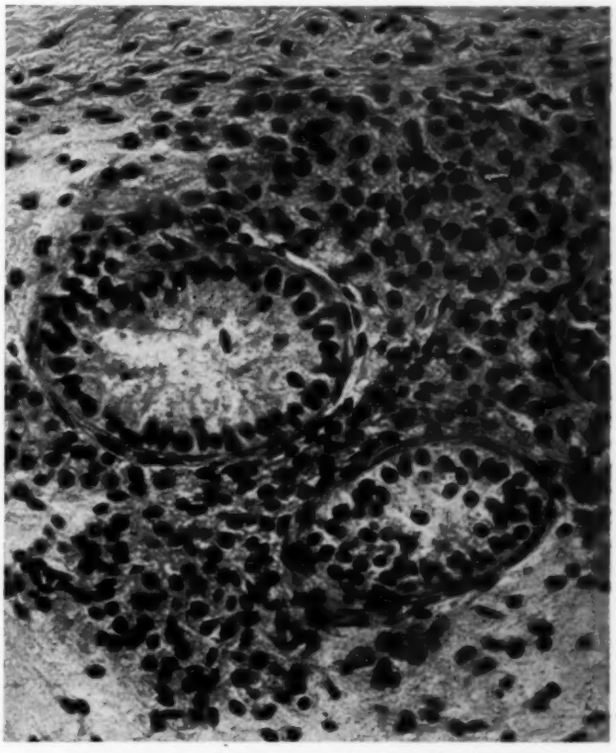

Fig. 5.—Photomicrograph of the testicular elements in the right intra-abdominal gonad. The testicular tubules have definite basement membranes and contain spermatogonia and Sertoli cells There are many interstitial cells surrounding these tubules.

In the patient described here the gonads had the external appearance of normal ovaries. An unhealed rupture point of a recent ovulated follicle was identified on the surface of one ovary. When this gonad was bisected, its interior was grossly normal ovarian tissue. The corpus luteum had a yellow festooned wall and a coagulum-filled centrum. Upon bisection of the opposite gonad, both normal ovarian tissue and testicular elements were discerned by gross inspection, in spite of the fact that the gland had the external appearance of a normal ovary.

4. Engle, E. T.; Yeaw, R. C., and Lattimer, J. K.: True Hermaphroditism: A Supplementary Report of a Case, J. Urol. **56**: 731-736, 1946.

5. Lattimer, J. K.; Engle, E. T., and Yeaw, R. C.: True Hermaphroditism: A Case Report with Interpretations, J. Urol. **50**: 481-496, 1943.

Microscopic examination of the gonadal tissue in our case revealed the corupus luteum to be histologically normal and young. Proved instances of ovulation in true hermaphrodites have not been described so far as we know. In addition to the corpus luteum, there were other corpora lutea in various stages of degeneration, which indicated that ovulation and corpus luteum formation had occurred previously in the gonad that contained the testicular tissue. These findings demonstrate that ovarian function can be maintained in the absence of the uterus, a fact that many authors have denied. We do not subscribe to the belief that ovaries do not function in the absence of the uterus.

The testicular tissue in the right ovotestis was composed of interstitial cells and seminiferous tubules with spermatogonia and Sertoli cells. The interstitial cells were numerous and appeared normal histologically. The entire amount of testicular tissue was approximately 1 cm. in diameter. There was little evidence of the production of testicular androgen, as indicated by the predominately feminine secondary sex characteristics. The patient had an enlarged clitoris, but the breasts and other characteristics were definitely feminine. This suggests the presence of active estrogen secretion. As Schiller [6] has remarked, it is difficult to understand why such patients as these are not masculinized to a greater extent by the testicular tissue as are some women who have small, virilizing tumors.

The microscopic findings in our case proved the patient to be a true hermaphrodite. Usually such studies are necessary. Some cases, however, may be accepted without microscopic proof, provided other significant evidence is presented. For instance, in one case reported by McIver, Seabaugh, and Mangels [7] histological examination of the intra-abdominal gonad, which was removed entirely, demonstrated it to be an ovary. The other gonad, which was located in the scrotum, was not removed, nor was a biopsy of it made. With only this one gonad remaining, spermatozoa were recovered. This would seem acceptable proof that there was functioning testicular tissue in the remaining gonad, thereby establishing the diagnosis of true hermaphroditism. Malgras and Gricouroff [8] reported another case in which an atrophic testis was removed and, although the other gonad was not seen, the patient menstruated subsequently. This would be acknowledged as indirect proof of true hermaphroditism.

Sisk and Cornwell [9] reported one patient (pseudohermaphrodite, Case 8) who had definite masculine body configuration, but who had ovaries and no testes. Witschi and Mengert [10] describe one patient with feminine body configuration, desires, and emotions who had two testicles and no ovarian tissue. Proof of the genetic sex was established by abdominal exploration, followed by removal of both testicles, which were located in a scrotum, and complete microscopic studies. Hormonal studies before castration revealed high urinary levels of estrogen. Following the removal of the gonads, the estrogenic hormone disappeared from the urine, and the gonadotropic hormone was elevated. Simultaneously, hot flushes and other menopausal symptoms developed. The only conclusion that could be reached was that estrogen was produced in the testicles. Such findings indicate that the presence of the male or female hormone in the urine does not always reveal the true genetic sex in hermaphrodites.

While the foregoing deals in large part with the establishment of genetic sex in the adult, certain portions pertain equally well to infants and children. A correct diagnosis early in life is important, because it allows the child's psychological sex to be developed in keeping with the genetic sex in cases of pseudohermaphroditism, or in keeping with the predominate gonadal sex in cases of true hermaphroditism. Since this is the ideal situation, exploratory operation and microscopic examination of the gonadal tissues should be made as early as feasible in the life of the child. Any evident abnormality of the external genitalia, such as a profound degree of hypospadias, requires thorough study. The physician should not be content until he is satisfied that the genetic sex has been established. Even if this requires abdominal exploration during the first few years of life, it should be done.

When the genetic sex has been determined with certainty in these young patients, a plan for the immediate and future medical and surgical care must be prepared. An adequate plan is to correct immediately only those portions of the external genitalia that would interfere with raising the child according to the genetic or predominate sex of the gonads. Other indicated procedures, such as the construction of a vagina, should be delayed until the patient is near the age of puberty. Construction of an artificial vagina in a very young person is frequently unsatisfactory because of the inability of the patient to cooperate in maintaining its caliber. The operative results are considerably better when the procedure is done near or after puberty. This delay in constructing a vagina does not interfere with the normal development of psychological sexual characteristics. The child then can be raised in accordance with the genetic sex and will, we believe, respond to her environment in such a mannar that the psychological sex will correspond to the genetic sex. The subsequent life of such a patient would be as free of conflicts as is possible.

In the mature person the genetic sex may play a secondary role to the psychological sex. Ellis,[11] Young,[1] Greenhill and Schmitz,[12] Novak,[13] Sisk and Cornwell,[9] and others have clearly shown that environmental factors are frequently more important than the sex of the gonads in the development of sex desires and emotions. Ellis [11] has collected from the literature the sexual histories of pseudohermaphrodites and true hermaphrodites. Very few were homosexuals; most were heterosexual. He used the designation heterosexual hermaphrodite to mean one

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12. Greenhill, J. P., and Schmitz, H. E.: Hermaphroditism and Sex Determination, West. J. Surg. **48**: 36-41, 1940.
13. Novak, E.: Sex Determination, Sex Differentiation and Intersexuality, with a Report of an Unusual Case, J. A. M. A. **105**: 413-418 (Aug. 10) 1935.

whose sexual desires are directed toward members of the sex opposite to which he or she has been raised. Some of these heterosexual hermaphrodites were raised as females and had entirely feminine roles, but their gonads were testes. He also called attention to the fact that every heterosexual hermaphrodite raised as a male took on a masculine role, and every one raised as a female took on a feminine role, irrespective of the character of the gonads present. These patients, for the most part, had adapted themselves to their sex roles in a satisfactory manner.

In persons who have a psychological sex at variance with the genetic sex, attempts to convert the patient to correspond with the genetic sex frequently lead to the development of severe mental conflicts. These conflicts may be so strong that the person subsequently is not suited to his or her environment. Such adult patients are usually better adjusted and happier if the genitalia are reconstructed in keeping with their psychological sex, disregarding completely the genetic sex. Reconstruction of genitalia along these lines has been done in a sufficient number of patients, and the results have been excellent enough to warrant acceptance of this dictum as a fact. Pratt,[14] as well as Ellis [11] and others, has reported such instances and stressed the importance of psychiatric evaluation. Most of the beneficial transformation that is produced is the direct result of surgically reconstructing the genitalia in keeping with the psychological sex.

This thinking is not unchallenged in the literature, but as Ellis [11] has pointed out, the bulk of the recent discussions indicate that it is correct. The problem in such adult patients is to alter the malformation in such a manner that the patient may assume the place in society to which he or she is psychologically conditioned. If this can be done best by disregarding the genetic sex we believe that such is the procedure of choice.

Reconstruction of the genitalia in pseudohermaphrodites or true hermaphrodites does not include castration. The only indication for castration is a pathologic lesion in the gonads themselves. The possibility of the development of malignant lesions in intra-abdominal testicles is so rare that castration is not justified because of this possibility alone. Removal of the gonads merely because they are opposed to the psychological sex will not change the psychological sex emotions but rather will take away from the patient hormonal influences that are beneficial. The removal of the gonads will produce various phenomena associated with castration. The patient in many instances has already demonstrated that the sex desires and emotions and the assumption of a given sex role in society are compatible with the presence of gonads of the opposite sex.

If the patient is a true hermaphrodite, as the one reported here, that portion of the ovotestis that is contrary to the psychological sex may be removed as long as sufficient gonadal tissue remains. Such was done in this case. In this particular instance it was not difficult to discern the true character of the gonad grossly when the gland was incised at operation. Doss and Priestley [15] reported an instance in which such a resection was performed. McIver, Seabaugh, and Mangles [7] state that there is no other instance recorded in which removal of one type of tissue in an ovotestis was accomplished. If this can be achieved during the procedure to establish the diagnosis of genetic sex, we feel that it should be done.

SUMMARY

A true hermaphrodite, 18 years of age, is reported. Microscopically, one gonad was proved to be an ovotestis and the other a normal ovary. The predominate genetic sex, the psychological sex, and the body configuration were female. The external genitalia were admixtures of male and female. The Müllerian derivatives were incompletely formed. Ovulation had occurred on several occasions, and the recent corpus luteum was histologically normal.

The genetic and psychological sex are both important in determining the diagnostic procedures that should be done and in deciding the most desirable sex to which a patient should be converted. The genetic sex, or the predominate gonad sex, is usually the most important if it can be determined in infancy, before the psychological sex is developed; the psychological sex is the most important if it is already developed and firmly fixed. All adult hermaphrodites should have competent psychiatric evaluation as soon as the diagnosis of the abnormality is made. Castration is not indicated in the surgical conversion of a pseudohermaphrodite or true hermaphrodite to one or the other sex, even though the gonads are of the opposite sex.

Judicial planning, well-chosen and correctly timed operative procedures, adequate psychotherapy, and hormonal therapy can make useful and socially acceptable persons of pseudohermaphrodites and true hermaphrodites. This is most emphatically true if the medical planning and procedures are instituted early in the life of the patient.

104 S. Michigan Blvd. (Dr. Brewer).

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15. Doss, A. K., and Priestley, J. T.: True Hermaphrodism: Report of a Case, J. Urol. **43**: 859-865, 1940.

Diagnosis of Protruded Intervertebral Disc.—There are four reasons why it is deemed advisable to do intraspinal investigations on all patients suspected of having a protruded lumbar disc: (1) Tumors of the spinal cord in, and cephalad to, the lumbar region may simulate the signs and symptoms of a protruded intervertebral disc. (2) In some instances, protrusion of the third, second, or first lumbar intervertebral disc may produce signs and symptoms commonly seen in protrusions occurring at lower intevertebral levels. (3) Multiple protrusions occur in about 18% of all cases of protrusion of an intervertebral disc, and since they may involve contiguous or scattered intervertebral spaces, contrast myelography is the only practical method by which they may be accurately localized prior to operation. (4) In rare instances, a protruded lumbar intervertebral disc and a tumor of the spinal cord may coexist, giving rise, usually, only to so-called typical signs and symptoms of protruded disc. (5) When contrast myelography is employed, the lesion is accurately localized in a high percentage of cases; thus the necessity of entering normal interspaces is obviated.—Hendrik J. Svien, M.D., Henry W. Dodge Jr., M.D., and John D. Camp, M.D., Importance of Spinal Fluid Analysis and Contrast Myelography When Protruded Lumbar Disc Is Suspected, *Surgery, Gynecology and Obstetrics*, November, 1951.

REHABILITATION OF THE AMPUTEE

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Proper management of the amputee patient demands more of the physician than surgery alone. The physician's responsibility includes supervision of a complete and integrated rehabilitation program embracing psychological preparation, adequate surgery, after-care of the stump and preprosthetic training, and provision of the prosthesis and training in its use. Only through this type of three dimensional care can the amputee be provided with the physical and psychological equipment he requires for adjustment to his social and vocational environment.

It should never be forgotten that the amputee patient has a psychological problem which, if allowed to go unrecognized and untreated, may become more disabling to the patient than the amputation itself. The emotion experienced at the loss of a limb has been very well compared to the grief one feels at the death of a loved one. A part of one's body has been permanently lost. The bewilderment and desolation common among the newly amputated expresses itself in the anxious questions which the amputee asks his physician: "Will I walk again? Will I work again? How will my family and friends react?"

The physician should consider it part of his responsibility to assuage these fears and anxieties as best he can; this is part of what we mean by psychological preparation. It implies that the patient will be treated not as a pathological entity, but as a highly individualized complex of traits, interests, and requirements. The newly amputated patient must be assured that his disability will not prevent him from becoming a happy and productive unit of the society to which he must return.

Demonstrations by other amputees who are already successfully adjusted, and who are accomplished in the use of their prostheses, are extremely valuable for this purpose. Whenever possible, the physician or the hospital should arrange to have the amputee patient meet other amputees with similar or severer disabilities. The patient is challenged to match or exceed the accomplishments of the other man; more important, he is made to feel that he is not alone with his disability, that thousands like him have made adjustments of which he, too, is capable.

Films, slides, and lectures are valuable when live demonstrations are not feasible. Occasionally the hospital's social worker will be called in to assist with a specific personal or financial problem. Perhaps the patient will be encouraged to use the time spent in the hospital to explore educational or vocational opportunities. Whatever the means employed, psychological adjustment of the amputee should be considered throughout his entire rehabilitation program.

The primary purpose of amputation surgery is, of course, to arrest the pathological process. Second in importance is provision of a stump which will enable the amputee to wear an artificial limb with comfort and utility. When an open amputation must be performed because of the emergency nature of the operation, it should be performed at the most distal point of viable tissue rather than at the site of election. This will permit the final revision or reamputation to be performed at the site of election without unnecessary loss of stump length.

The aim of the final procedure is provision of a stump of optimum length shaped to allow proper fitting of the artificial limb. Four basic surgical procedures have been developed for leg amputation: the Syme's amputation, the below-knee amputation, the Stokes-Gritti amputation, and the above-knee amputation. While modifications may be necessary in individual cases, these four operations will satisfy the requirements of the vast majority of leg amputations.

The Syme's amputation provides a desirable end-bearing stump, utilizing the skin of the heel, which is biologically prepared for weight bearing. The tibia and fibula are transected at a point about ¼ in. proximal to the articular surface of the tibia. The os calcis is removed subperiosteally, preserving the skin of the heel for weight bearing, either with or without a prosthesis.

The site of election for amputations above the ankle is 5 to 6 in. below the knee, at which level optimum conditions of support and leverage obtain. A side-bearing stump is provided which takes the body weight evenly distributed at three pressure bearing areas, the internal condyle of the tibia, the head of the fibula, and the tibial tubercle. These stumps are ideal for wearing a prosthesis, although shorter below-knee stumps can also be utilized.

The Stokes-Gritti procedure for above the knee amputations provides an end-bearing stump able to meet excessive demands. The patella is fused to the cut end of the femur at the adducted tubercle, made at the flare of the femur. Like the Syme's amputation, this type of amputation utilizes skin that is biologically prepared for weight bearing—in this case, the skin of the knee.

Leg amputees who have lost the valuable knee mechanism will find themselves considerably more restricted than the below-knee amputee, and the knee joint should be preserved whenever it is possible to do so. The site of election for the above-knee amputation is at the juncture of the lower and middle third of the thigh, but satisfactory stumps are possible at almost any level. It should be remembered that a stump which is too long is as unsatisfactory as one which is too short. In the above-knee stump, weight is transferred to the ischium, depending on the length and shape of the stump. Leg amputees with very short stumps, and patients with hip disarticulations, can be fitted with tilting table limbs, and similar prostheses can be used by hemipelvectomy patients.

Arm amputations are usually performed above the wrist, below the elbow, and above the elbow, but special procedures are also available to meet the needs of specific cases. The Krukenberg procedure, in which the forearm is split into radius and ulna, is a very valuable device for the blind, double-arm amputee, who must retain tactile sensation in one of his stumps. The Krukenberg operation provides some prehensile power without necessitating the wearing of a prosthesis.

Kineplasty is another special technique which provides the arm amputee with excellent control over the

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artificial arm. The live muscle remaining in the stump is canalized and lined with skin, and the surgical defect covered. An ivory or plastic peg is inserted in the canal and is attached to the artificial arm by a system of levers. Thus the muscle which would normally activate the ablated hand is used to control the prosthesis.

A systematic program of after-care of the stump, in preparation for wearing a prosthesis, has as its objectives the prevention of contractures and the development of strong, painless, and properly shrunk stumps. Traction is applied postoperatively to accomplish closure of the wound in open amputations and to loosen the skin closure in primary flap amputations. Proper bed posture is essential to prevent contractures, and the practice of putting a pillow or sandbag under the stump cannot be too strongly condemned. When the amputee has recovered from his operation, the physical therapist will institute a program of passive and active exercises, designed not only to improve the stump, but to provide physical conditioning of the entire body. Massage, which may be indicated to reduce contractures in old stumps, is strongly contraindicated for fresh or painful stumps.

Shrinkage of the stump is accomplished through the application of elastic bandages. A 4-in. bandage is used for the below-knee amputee and a 6-in. bandage for the above-knee amputee. The below-knee amputee can usually be taught to apply his bandages himself, but the above-knee amputee will require the assistance of the nurse or physical therapist.

Advanced preprosthetic training of the amputee will include instruction in crutch walking and hopping, in addition to general physical conditioning and specific stump exercises. A complete program of preprosthetic training, under the supervision of competent physical therapists, can easily mean the difference between poor and excellent adjustment to the artificial leg. The prosthesis should not be fitted until the stump is properly shrunk and free of pain and contractures.

Provision of a satisfactory artificial limb is the responsibility of the physician as well as the limb maker. While the surgeon is not expected to become thoroughly familiar with the limb maker's art, he should have sufficient knowledge of prosthetics to assist his patient in the selection of an artificial limb.

The large variety of materials and designs in artificial limbs presents the amputee with a bewildering problem of selection unless he has professional guidance. The surgeon should cooperate with the limb maker to insure proper fit of the limb, a consideration far more important than the design of the limb or the materials of which it is made. Fitting depends primarily on proper measurement, secondly on proper construction of the prosthesis, and, finally, on the adjustment of the prosthesis to the patient's stump. Too many limbs lie idle in closets or bureau drawers while their owners lead wheelchair and crutch existences because weight bearing on the prosthesis is painful or the amputee has not been taught to use his new limb. If possible, the amputee should be fitted at a shop close to his home, to enable him to return as often as is necessary for adjustments and repairs.

The type of limb selected for the leg amputee will be influenced by his weight and occupation. Materials generally used include metal and willow wood, the latter preferable for children because the necessary frequent changes can be easily executed.

Selection of the prosthesis for the arm amputee is a far more complicated matter, and here we must consider the patient's entire personality as well as his physical requirements. The two basic functions of the artificial arm, dress and utility, may be combined in any proportion to meet the specific needs of the individual patient. Teachers, lawyers, and other persons whose work brings them into contact with the public, but who do not use their hands a great deal, usually require only a light dress arm with minimal function. The farmer or laborer, on the other hand, requires the maximum function possible, and he must frequently sacrifice appearance to utility and wear a mechanical arm. An array of special devices is available for the unusual or complicated case. The Krukenberg procedure, previously referred to, should be performed on one stump of the blinded, bilateral arm amputee. A functional prosthesis can then be applied to the stump of what had been the dominant hand.

The kineplastic procedure is ideal for bilateral arm amputees, since this technique provides a high degree of prehension and control. The kineplastic arm can be worn with either hand or hook, the former for cosmetic purposes and the latter for greater utility.

Training in the use of the prosthesis is the most essential element in successful rehabilitation of the amputee. An artificial limb is a sensitive and delicate instrument, and the amputee cannot be expected to become adept in its use without professional instruction. Ideally this training is carried out in a rehabilitation center, but it can be done in a general hospital with good physical and occupational therapy departments and staff members who know amputee training techniques.

A four week training program will generally suffice for the single-leg amputee, though more time will be required to train a man who has lost both legs. During the first week the leg amputee learns to apply his limb and to balance on it. During the second week he is taught to walk on level ground, and by the third week he is walking on irregular terrain and up and down stairs. The fourth week is devoted to advanced instruction in sports activities, and completion of the general gymnastic program that has been carried on throughout the entire period of training. At the time of discharge the single-leg amputee will be walking easily with no support, and the double-leg amputee can navigate successfully with the help of one cane.

Before the rehabilitation program can be considered complete, the amputee should be assisted with whatever personal or vocational adjustments are necessary. If he cannot return to his former occupation, he may be referred to a center for vocational guidance and training. Rehabilitation does not end until the patient has received all the restoration of which he is capable.

It is obvious that the type of complete service outlined above cannot be provided by the physician alone. The teamwork of many specialists is required, with the physician at the head of the rehabilitation team. The services of the physical therapist, the occupational therapist, the limb maker, the rehabilitation nurse, and the vocational counselor are merged to provide a total program individualized to meet each patient's needs.

The community, too, is a member of the rehabilitation team, for the amputee cannot be said to be rehabilitated if he will not be accepted by the community to which he must return. One of the major aims of rehabilitation is education of the public to the potentialities of the amputee; in a sense the public must also receive "psychological preparation." Amputations should never be regarded as insurmountable obstacles to a normal and satisfying life.

The management of patients with double or complicated amputations demands special skills. Illustrations of how the basic rehabilitation program is adopted to meet the needs of these severely disabled persons are supplied by the following case reports.

CASE 1.—A young Greek soldier was severely injured when a land mine exploded in front of him, resulting in total blindness and necessitating amputation of both arms below the elbow. The young man was sent to the United States through the auspices of the Greek War Relief for rehabilitation at the Kessler Institute for Rehabilitation in West Orange, N. J. A medical case worker assisted him in overcoming certain psychological difficulties induced by the severity of his injury and complicated by the language barrier he experienced in this country. A Krukenberg procedure was performed by the orthopedic surgeon on his left stump, and the patient rapidly learned to manipulate the bones of the forearm as a prehensile tool. A kineplastic operation, performed on the muscles of the other stump, enabled him to be fitted with a kineplastic prosthesis. The occupational therapist taught him to use his prosthesis for the routine pursuits of life, and he learned to feed, dress, and groom himself. A case worker from the New Jersey Commission for the Blind was assigned to teach him braille and orientation, and the institute physical therapist taught him balance and coordination. This man is now able to read braille with the unfitted stump and is able to care for his personal needs. He has since returned to Greece.

CASE 2.—A coal miner, injured in a rock fall, suffered a broken back which caused total paralysis below the waist. Several months after his injury severe decubitus developed, which necessitated midthigh amputation of both legs. An unsuccessful attempt to remove urinary calculi left the patient with a draining abdominal fistula at the time of his admission to the institute. Plastic surgery was performed to close the remaining decubitus ulcers; the calculi were removed, and the fistula closed by the urologic surgeon. An intensive program of physical reconditioning and amputee training was started. The patient was first fitted with short artificial legs and taught balance and simple walking techniques. As his progress improved, his artificial legs were lengthened, and he was taught a faster gait. At the time of his discharge the patient, a paraplegic, double, above-knee amputee, could ambulate on artificial legs and crutches, and his medical problems had been solved. He now operates his own restaurant in his home town.

CASE 3.—A patient with triple amputation was admitted to the Kessler Institute. As a result of an electrical accident both arms were amputated below the elbow, and one leg was amputated above the knee. The patient was fitted with two kineplastic prostheses, and the occupational therapy department trained him in the use of these devices for a variety of personal and vocational activities. The patient became increasingly adept with his artificial arms, and at the time of discharge he was able to use the arms for writing, shaving, dressing, eating, and some types of manual work. A standard above-knee prosthesis was provided, and the patient received physical therapy and walking instruction. He has since returned to work, able to ambulate successfully and manage his triple prostheses to meet the demands of his daily life.

The significant feature of these case histories is the teamwork that was provided by the medical and professional staffs to solve the numerous problems of these severely disabled persons. Rehabilitation is seen as an integrated series of services focusing the experience of many minds, the skills of many sciences, and the values of many techniques on the single objective of restoring the disabled to useful life. As applied to the amputee, it brings the surgeon, limbmaker, therapist, and community together in an organized attempt to rebuild the patient to economic independence and social satisfaction.

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LAME BACK

SOME COMMON CAUSES AND CONSERVATIVE TREATMENT

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There has been and there still is a great tendency to ascribe all backaches to one cause—e. g., for many years the term "sacro-iliac dislocation" has been held in great vogue; latterly this seems to be going out of fashion, and the diagnosis of "ruptured disk" is in the ascendancy. All too often a snap diagnosis is made without reference to history or physical findings. Too many patients suffer from backache after adequate removal of the displaced nucleus pulposus. How to go on from there is the problem. There are many causes of acute and chronic backache, so that one single label is not the answer.

ETIOLOGICAL FACTORS

Fundamentally the reason for mechanical pain in the back is an abnormal change in the normal physiological curves of the spine. It is the duty of the physician to find out if possible the condition responsible for the difficulty. The main etiological factors fall into six groups: (1) traumas, (2) bad posture, (3) congenital malformations, (4) diseases of spinal bones and joints, (5) malignant disease, and (6) diseases outside the spine.

In general, there can be severe low back pain without limitation of motion in the spinal column per se, and there may be no evidence of pathological condition by x-ray examination. On the other hand, there can be a good deal of bone damage as shown by x-ray and no backache. Patients having lumbar spines which show more or less spur formation that has been going on for many years suddenly have an acute attack of pain, muscle spasm, and even sciatic pain. These patients recover, but the pathological picture does not change. Furthermore, there may be intermittent recurrence of backache with complete freedom from pain during the intervals.

Trauma.—The commoner traumatic lesions are contusions, sprains, strains, dislocations, compression frac-

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tures, and ruptured discs. All these are characterized by pain, muscle spasm of the erector spinae muscles, and limitation of motion of the lower part of the spine. Sciatic pain may be present, and sometimes there is a lateral list of the spine. These symptoms mean a lame back and are usually present in nearly all conditions in which there is irritation of the low back region from whatever cause.

Bad Posture.—This includes postural attitudes in standing, sitting, lying, and walking. Examples are standing with the chest flat and thrust backward over the pelvis, head forward and shoulders sagging, also habitual standing on one leg, which produces faulty attitudes; sitting in a slouchy manner with the buttocks out on the edge of the seat and the chest caved in or on a seat which does not fit; lying in curved positions, especially on soft or sagging beds. The postural attitudes in walking usually exaggerate those of standing. A short leg results in a total scoliosis with the leverage power greatest at the lumbosacral or sacro-iliac joints. The short leg is determined by putting lifts under the heel until the pelvis is level and the spine plumb. Foot strain pain may be referred to the lower back and also strain from a prominent abdomen, short posterior leg muscles, and contracted fascia lata producing a lumbar lordosis.

Congenital Abnormalities of Spine.—These may be responsible for back pain, first, because these abnormalities interfere with the normal mechanics of the spine and, second, because the backs of these patients are not always as strong as those of normal persons.

Arthritides of Spine.—The two common types of arthritis of the spine are osteo and rheumatoid arthritis. Marie-Strümpell, gonorrheal, typhoid, and paratyphoid types are less common, as also is degeneration of one or more intervertebral discs.

Infections Involving Spine.—These are tuberculosis, which is comparatively rare, and osteomyelitis.

Affections of Bones of Spine.—Osteoporosis seen in the aged, in hormone imbalance, and in disturbances of the parathyroid gland, Paget's disease, osteomalacia, and aneurysm of the aorta may be the cause of back pain.

Malignant Diseases.—Sarcoma, Ewing's tumor, myeloma, carcinoma, Hodgkin's disease, and leukemia all may cause destructive lesions of the vertebrae and must be considered in making a diagnosis.

Diseases Outside Spine.—There are many diseases outside the spine which have symptoms referred to the spine. In many acute infections, local or general, there is often backache and spasm of the erector spinae muscles —e. g., the early prominent symptom of smallpox is severe pain in the low back. Peptic ulcer, malignant disease of the stomach or duodenum, and retrocecal appendicitis may cause severe pain in the spinal region.

Diseases of Pelvis.—Tumor and cancer of the ovaries or uterus, pelvic adhesions, displaced uterus, bladder stone, prostatic diseases—all these may cause low back pain. Conditions involving the retroperitoneal region often produce pain and muscle spasm in the lumbar region. Among the commoner of these are abscess of the kidney, perinephritic abscess, retroperitoneal abscess, stone in the kidney, in the pelvis of the kidney, and in the ureter, and kinks in the ureter.

Pregnancy, especially in the later months, often produces low back strain. After delivery there is often marked weakness of the abdominal muscles, which results in chronic backache.

Fatty Tumors and Hematomas.—Fatty tumors and hematomas in the gluteal region should always be sought for, since they often cause sudden acute attacks, frequently disabling. These tumors are found beneath the gluteus maximus muscle, and a portion of one extrudes through the vascular spaces in the deep fascia just below the iliac crest and near the top of the sacro-iliac joint. Sciatic pain frequently accompanies the extrusion.

It must be remembered that there can be severe backache, especially over the posterior surface of the sacrum, without muscle spasm or limitation of motion in the lumbar spine. These patients usually have a contracted fascia lata, short posterior leg muscles, functional scoliosis, prominent abdomens, or chronic foot strain.

Finally, neuroses, chronic emotional disturbances, malingering, and compensation problems all may have their symptoms, either real or fancied, located in the low back region.

It is obvious that every effort should be made to find the cause of trouble before beginning therapy. A snap diagnosis may be futile and fatal. The x-ray examination must be complete and thorough. If the anteroposterior and lateral x-rays do not show pathological condition, it is often necessary to take x-rays of the oblique view; also standing anteroposterior x-rays with side bending and lateral views in extension and flexion may be required.

TREATMENT

The treatment of lame back may be separated into four stages: (1) the acute stage, (2) the subacute stage, (3) the chronic stage, and (4) the rehabilitation stage. All this is based on the assumption that all conditions predisposing to low back pain which are not concerned with those causes which enter into the mechanism and physiology of the spine have been removed where possible.

Acute Stage.—This varies from a mild attack to a very severe and disabling one. In the mild, short-lived attack use of a transverse double-thickness adhesive plaster strapping will usually suffice. In the severer attacks bed rest on a firm mattress is indicated. (Some patients are not comfortable on a hard bed.) Sedatives, such as the salicylates, codeine, meperidine (demerol®), and even morphine may be necessary. Sedatives relieve both the pain and muscle spasm.

Heat in the form of hot packs or a heat lamp at intervals of four to six hours for periods of 15 to 20 minutes often gives great comfort. If sciatic pain is present, a pillow under the knee relaxes the nerve and may help to relieve some of the pain. The patient should assume the position of greatest comfort. Sometimes continued and constant bed rest produces increased discomfort; in that case the patient should be allowed up for short periods, since the postural change seems to relieve pain.

Subacute Stage.—When the very acute phase subsides gradually, but certain movements tend to increase the discomfort, the application of local heat plus gentle massage is beneficial. If there is no sciatic pain, the patient is taught to compress his buttocks slowly and firmly 25 times three of four times daily and to raise his head and shoulders off the bed or table a short distance, holding this position for three or four seconds, repeating this 25 times three or four times a day.

A back support is indicated at this time. The best support is a properly made corset, which is hard to obtain. An efficient corset is so constructed that it fits the back in both the sitting and standing positions. It must give an abdominal lift. The cloth must be cut so that the iliac crests are let out into it; otherwise the corset will ride up. The iliac crests never change, but the soft parts do. Pressure from the corset often causes alterations in the soft parts, increasing the pressure on the crests of the ilia, thus defeating the purpose of the corset, which is to restore normal balance of the spine and pelvis. In this case the corset must be altered to fit.

There have been many braces designed for lame backs, but in my opinion they are not as efficient as a properly fitted corset, simply because no brace can follow the contours of the back in both the sitting and standing positions, while a corset will do so.

Chronic Stage.—This stage is usually a continuation of the acute and subacute stages. However, many lame back patients have never had an acute attack.

The treatment of the chronic type of back condition is to avoid any motion that causes discomfort or pain and to persist with adequate measures of protection until pain has disappeared and motion has been restored without spasm or pain. Patients who stand with one side of the pelvis lower than the other and who have low back pain must have the pelvis leveled with a lift under the heel of the shoe. Many lame backs are relieved by this simple procedure, even those with pain in the sciatic nerve. Those who have bilateral limitation of straight leg raising due to contracted posterior leg muscles or fasciae latae may be relieved by raising the heels of both shoes.

Rehabilitation.—Exercises to relieve the fascial contractures should be given but not if sciatica is present. Next, the anterior thigh structures should be stretched and, finally, the posterior leg contractures. When the acute low back symptoms have subsided, exercises to develop the corset muscles of the patient—that is, the gluteal and abdominal muscles—should be carried out until their function is normal.

As soon as these muscles have sufficient tone and strength more attention should be paid to correcting bad posture so that in time the physiological curves of the patient will be restored to normal.

A common exercise prescribed for lame back is to have the patient bend over. Lame backs are often caused by bending over. It would seem, then, that such an exercise should not be performed. Furthermore, it does nothing to restore the physiology of the spine.

In cases of contracted spinal muscles following an attack, stretching these muscles may be accomplished in two ways. The first is to have the patient flex his knees and thighs, then grasp his knees with his hands and slowly flex his trunk, maintaining the position for 20 or 30 seconds and then relaxing, repeating the maneuver 10 or 15 times. A second method of stretching is to stand with the knees extended and bend forward, allowing the head and body to hang in a relaxed manner for a minute at a time for 10 or 15 times once or twice a day.

No exercise should be performed that causes discomfort. Finally, after contractures are removed and the corset muscles are normal, the posture must be restored in order to help prevent or at least minimize any future attacks.

SUMMARY

Ruptured nucleus pulposus is not the sole cause of lame back. There are many diseases of the spine and many outside the spine itself which may produce pain in the back. Treatment of the lame back per se depends on the acuteness of the attack. Finally, physical therapy measures designed to remove inhibiting contractures, restore muscular tone and function, and correct posture will result in a large number of cures.

234 Marlborough St.

MULTIPLE POLYPOSIS

RESULTS OF FULGURATION OF POLYPS IN DISTAL PORTION OF COLON AFTER ILEOSIGMOIDOSTOMY AND COLECTOMY

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and
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Present knowledge concerning multiple polyposis (congenital or hereditary polyposis) indicates the seriousness of this disease and an almost invariable termination in single or multiple carcinomas. Ideally, therefore, it would seem best therapeutically to remove the entire colon. Because of the consideration of the patient's comfort, his social life, and the adverse mental reaction of some patients having an ileostomy, it seems necessary to deviate, if safely possible, from the absolute ideal. We are concerned with the success of such a deviation.

From the Section on Proctology, Mayo Clinic.
Read before the Section on Gastro-Enterology and Proctology at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 14, 1951.

PRELIMINARY CONSIDERATIONS

In the group of cases studied, the patients had been treated surgically by ileosigmoidostomy and entire removal of all of the colon proximal to the anastomosis. The surgeon's effort had been to make the ileosigmoidal stoma low enough in the sigmoid so that the residual portion of the colon could be thoroughly observed through a sigmoidoscope (25 cm. long) and any polyps fulgurated through such an instrument. If this could be done, it seemed it would permit the patient to continue his regular occupation and social activities and have, for all practical purposes, normal bowel function.

We have studied 27 cases in which the associated surgical procedures mentioned were accomplished and

fulguration was applied to those polyps in the distal 25 cm. of the colon. A number of considerations deserve special scrutiny. The ultimate value of these complementary procedures must be judged by results observed over a long period of time and these results compared with normals to obtain a true evaluation. It will be apparent that we are presenting an interim report rather than a completed study and that many years may be required before all the facts may be gathered.

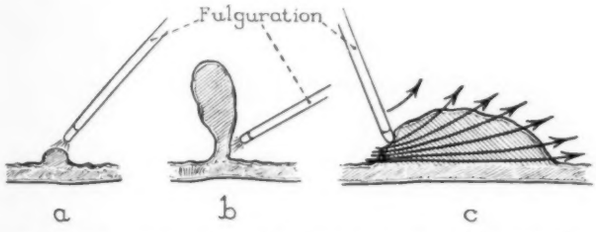

Fig. 1.—The method and site of applying the spark from the fulgurating electrode to (*a*) a small sessile polyp, (*b*) a pedunculated polyp, and (*c*) a larger sessile polyp.

The method of accomplishing the fulguration of the polyps may be of interest. We fulgurate the polyps with monopolar or Oudin current through a metal sigmoidoscope 25 cm. long. We do not apply the fulgurating electrode directly to the polyp but work with an intervening spark gap of about ⅛ to ¼ inch (3 to 7 mm.) (Fig. 1). The regular 25 cm. Buie sigmoidoscope with an auxiliary suction tube incorporated in the instrument to remove smoke is employed. The auxiliary suction tube is attached by means of a rubber tube to a Y connector and this to the suction. The usual suction tip employed for the removal of feces, mucus, fluid, and blood, if necessary, is attached to the other arm of the Y connector. Clamps are placed on both rubber tubes attached to the Y connector in order that one tube may be closed while the other is being employed. This may seem complicated, but in practice it proves to be a simple mechanical method to provide suction for each purpose (Fig. 2).

Another question that may prove puzzling is where to begin the fulguration and how to proceed. It might seem equally logical to begin at the upper point to which the sigmoidoscope can be inserted and fulgurate distally or to begin in the anus and fulgurate proximally. In practice, it probably makes little difference. Our personal choice has been to begin at the anus and fulgurate a few polyps on the first occasion to determine the patient's tolerance and reaction to the burned surface. In some instances patients will have an elevated temperature and considerable abdominal discomfort, and others will tolerate the fulguration of a large number of polyps without any untoward reaction. By beginning at the anus and gradually fulgurating proximally, the patient seems to learn to cooperate more satisfactorily and the surgeon also has an opportunity to observe the previously treated area. Usually the fulguration is carried on daily; however, in some particularly apprehensive patients, it would seem best to permit an occasional day of rest; in spite of their willingness, many patients tend to reach a point of saturation, after which they become less cooperative and a day of "vacation" will assist them in returning to a more cooperative attitude. If the polyps are fulgurated first and the ileocolostomy and colectomy are to follow, it is well to allow 10 to 14 days between the completion of the fulguration and the subsequent surgical procedure, in order to permit the acute inflammatory reaction subsequent to the fulguration to subside. This prevents limitation of the surgeon's procedure when he attempts the abdominal portion of the operation.

It would be of little value to enumerate specifically the number of individual fulgurations in each case. In some instances we would find it necessary to continue fulguration daily or almost daily for three weeks, and at the time the patients returned for re-examination we might be able to complete the fulguration of new or recurrent polyps at one time. Our general purpose in the Section on Proctology at the Mayo Clinic is to clear the bowel of the polyps thoroughly just before or soon after the ileosigmoidostomy and colectomy, and then to re-examine the distal portion of the colon every three months for two or three times, after which we extend the interval to six months and then once each year, or more frequently, depending wholly on the rapidity of the reappearance of polyps in each patient. Even after prolonged fulguration, there is usually little or no distortion of the contour of the bowel except in those cases in which heroic fulguration is attempted.

Some patients fail to appear as regularly as they should for re-examination following the previous surgical treatment and fulguration because of financial reasons or because of the inability of the patient to evaluate his problem satisfactorily and to understand the need of continued observation; this occurs in spite of our emphatic instructions. Some patients seem to become careless because they feel well and have normal function. The patient's failure to return for examination seems to be the weakest link in the surgical and subsequent procedures. It is interesting to observe that over a rather prolonged

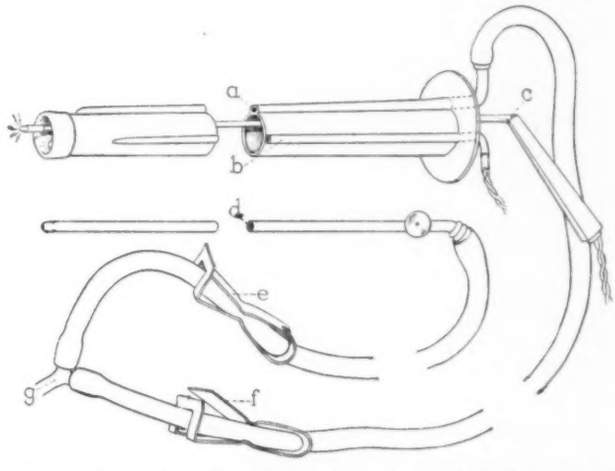

Fig. 2.—Fulgurating sigmoidoscope 25 cm. long. (*a*) Suction tube for the removal of smoke. (*b*) Tube for light carrier. (*c*) Insulated fulgurating electrode. (*d*) Suction tube for the removal of feces, fluid, blood, and mucus. (*e*) and (*f*) Clamps to direct the suction to the tube employed. (*g*) Metal Y tube connected to the source of suction and the two rubber hoses leading to the suction tubes. (Reprinted with permission from Buie, L. A.: Practical Proctology, Philadelphia, W. B. Saunders Company, 1937.)

period of observation these patients do not seem to suffer remarkably increased incidence of carcinoma.

The difficult problem at times seems to be: Should the polyps be fulgurated first, or should the ileosigmoidostomy and colectomy be accomplished first? In practice,

there is no fixed rule that would apply in all cases. Obviously, if it is a borderline condition in which the polyps are so numerous that their thorough destruction by fulguration seems doubtful, it would be advisable to fulgurate first. If a malignant lesion or lesions have been diagnosed roentgenologically higher in the colon, then it would seem equally obvious that the ileosigmoidostomy and colectomy should be done prior to the fulguration. In some instances in which there are comparatively few polyps, and these small and widespread with no roentgenologic evidence of other than polypoid lesions proximal to them, either procedure may take precedence. In other instances, the patient may wish to postpone the colonic operation for a short time; in such circumstances, the fulguration frequently can be completed during the interval between the original examination and the ileosigmoidostomy. In general, the decision concerning which should be accomplished first must rest with the surgeon after he has all of the diagnostic evidence, and his conclusion frequently will need to be modified by the patient's desires.

RESULTS

Two of the 27 patients in the group studied died from bronchial pneumonia soon after the abdominal operation was accomplished. The death of another resulted from carcinoma two years after the colectomy and ileosigmoidostomy were accomplished, but, at the time the colon was excised, it was noted that there were two carcinomas; the malignancy of these was graded 1 (Broders' method), and they were type B according to Dukes' classification. The sister of the last-mentioned patient also succumbed to carcinoma originating in the sigmoid above the level that could be reached with the sigmoidoscope. The carcinoma originated 34 months after the ileosigmoidostomy. In the latter instance, the patient postponed the colectomy too long, although it had been urged on numerous occasions. Two other patients in the group studied died five and eight years, respectively, after treatment was instituted from causes other than multiple polyposis. The remaining 21 patients are living and have been under our observation for 6 to 19 years.

The most frequently observed symptoms prior to treatment were bleeding, diarrhea, abdominal cramps, and constipation. Twenty-four of the 27 patients observed bleeding with evacuation of stool. Twenty-one complained of diarrhea, 11 complained of having had abdominal cramps, 3 noted constipation, and in 1 case no symptoms were observed. The duration of the diarrhea varied from 3 weeks to 30 years, and bleeding from 2 to 13 years. Abdominal cramps were noted for four years in one instance, and for much shorter intervals in all others. This brief résumé of the outstanding symptoms emphasizes further the need for sigmoidoscopic examination when any symptoms referable to abnormal colonic function occur.

The ages of the patients in this group at the onset of the symptoms is of special interest because of the great divergence between the age of the youngest and that of the oldest. One patient could not remember when he did not have diarrhea. Four patients observed the first symptoms during the first decade of their lives, 6 in the second, 6 in the third, 1 in the fourth, and 2 in the fifth. The remaining seven could not set any specific date or were so vague in their statements that we did not feel justified in including them in this evaluation (see accompanying table).

Ages of the Patients, in Decades, When They First Noted Symptoms, When They Were First Examined Sigmoidoscopically, and Present Ages

	No. of Patients by Decade Groups							
Age in decades	1	2	3	4	5	6	7	8
Symptoms first noted	4	6	6	1	2	..	..	..
Time of first sigmoidoscopy	..	2	11	8	2	3	1	..
Present age	..	..	3	4	10	3	1	1

The ages of the patients at the time of our first observations varied remarkably from those at the onset of the symptoms. Two were first observed during the second decade of their lives, 11 in the third, 8 in the fourth, 2 in the fifth, 3 in the sixth, and 1 in the seventh.

Two families represented by several patients in the group studied afford an interesting opportunity for conjecture, but without further evidence it seems unwise to attempt to reach a conclusion. The first family is represented by a brother and sister, who died as a result of carcinomas developing before or after ileosigmoidostomy, fulguration, and, in one case, colectomy. The woman died at the age of 33 and the man at the age of 37. In the woman a carcinoma developed in the sigmoid above the level that could be reached with the sigmoidoscope. This was possible because of the patient's reluctance to follow the advice she received to have a colectomy. The man had two carcinomas, Grade 1 (Broders' method) and Type B (Dukes' classification), at the time of the colectomy. The fact that other members of the same family in preceding generations succumbed to carcinoma in the colon at about the same age or within the next decade would suggest that there was, in this family, a hereditary age relationship between the development of carcinoma and the presence of multiple polyposis. The second family would also tend to suggest the same age relationship. This family is represented by at least seven members of both sexes, but they were not all included in the group studied. The first members of these families were two women, aged 56 and 63, who had carcinoma in the distal 10 cm. of the colon at the time they were first observed. They also had multiple polyposis. Each of these women, and a brother, had several children who had multiple polyposis, and all the children are in their fifth decade of life or older without any evidence of carcinoma having developed. In these families it would seem that the tendency for carcinoma to develop, while not absent, is less marked or retarded.

Parenthetically it may be of interest to mention a patient not included in the group, who has passed through two full-term pregnancies without untoward reactions either in her general health or in the development of polyps. One female patient in the group studied had been treated surgically for bilateral carcinoma of the ovary, Grade 2, prior to the diagnosis of multiple polyposis seven years ago. She is still living.

The treatment and periodic observation have seemed satisfactory so far, inasmuch as none of the patients except the two mentioned has died as a result of the disease for which he was treated or any related disease. There seems to be a satisfactory explanation of these two deaths, which does not wholly discredit the suggested treatment. The employment of antibiotics and the increased understanding of surgical problems have reduced the number of postoperative deaths and complications.

At the present time the ages of the 22 living patients vary from 20 to 70 years. Three are in the third decade of life, 4 in the fourth, 10 in the fifth, 3 in the sixth, 1 in the seventh, and 1 in the eighth. We are seeing additional patients who have been treated similarly, and in general their progress parallels that of this group, with no unusual developments.

It is a sweeping statement to make, but all the patients seem to be living and working without appreciable handicaps. The occupations include housewife, student nurse, bartender, farmer, credit manager, Salvation Army officer, cattle buyer, and electrician. Most of the patients seem happy and, in spite of an adjusted outlook, anticipate their future with enthusiasm.

SUMMARY AND CONCLUSIONS

It appears that ileosigmoidostomy, with the removal of all of the colon proximal to the anastomosis, and fulguration of the polyps in the remaining segment of the colon, produces a satisfactory solution to the difficult problem of polyposis. This solution of the patient's problem permits normal activity and outlook. Periodic examinations must be continued to obtain the optimal result. The age at which carcinoma occurs in particular families in which multiple polyposis is common may be peculiar to that family. The employment of antibiotics and increasing knowledge relative to the solution of some problems associated with extensive operations on the bowel have decreased the postoperative mortality and morbidity of these patients. The study should be continued.

PRACTICAL APPLICATIONS OF PROGRESSIVE RESISTANCE EXERCISES

Arthur L. Watkins, M.D., Boston

The prescription of any of the many varieties of therapeutic exercise should be detailed and specific depending on their purpose. For example, the aim may be to improve coordination, reeducate muscles, increase range of joint motion or enhance endurance. The purpose of progressive resistance exercise is primarily that of increasing strength. This technique is based on the sound physiological principle that one must contract against a resistance which calls forth a near maximal voluntary effort and that the resistance must be progressively increased in order to significantly and rapidly improve muscular strength or torque. There is a large body of evidence based on empiric practice that this is true for normal persons, as, for example, in the training of professional weight lifters. For a more detailed discussion of the physiology of this type of exercise the reader is referred to a recent publication by Hellebrandt.[1]

The application in clinical medicine of the principles of progressive resistance exercise is primarily due to the work of DeLorme [2] and dates back only to 1944. Because of his early successes, its use in a wide variety of pathological conditions has been studied. It is the purpose of this paper to draw attention to the more frequently seen clinical entities in which progressive resistance exercise has been demonstrated to be of practical value.

PRINCIPLES OF TECHNIQUE

Experience has proved that in order to develop muscle strength by resistance exercises at an optimum rate, not more than approximately 30 repetitions of a single exercise each day are necessary. The usual practice is to initially determine by test loads that resistance which the patient can move through normal range of motion of the joint 10 times and no more. This is known as the 10-repetition maximum and forms the basis for the exercise routine. For purposes of warm-up one starts with 50% of the 10-repetition maximum, which is completed 10 times, then a short rest period with an increase in the load to 75% of maximum, which is again repeated 10 times, and finally the 10-repetition maximum itself is the last exercise stint. Best results are usually obtained by daily exercise of 30 repetitions as described for each joint motion. This number of 30 repetitions is, of course, arbitrary and may have to be reduced in some instances and may be slightly increased in others. It has been shown that by increasing the repetitions to 50 or 100 daily the efficiency of this method of exercise is greatly reduced, since it is generally impossible for persons to exert maximum effort repeatedly. It has also been discovered that it is important to have rest periods of one or two days each week.

In order to make proper progression of resistance, one day each week is set aside as test day, at which time the exercise load is increased to determine a new 10-repetition maximum. During the following week this new figure is used as the 100% value, and new values for the three sets of 10 repetitions are based on it. During the first few days of exercise there may be a rapid increase in the resistance that can be overcome, which is undoubtedly due to learning how to exercise, rather than to a true increase of strength. After this one can generally expect a fairly rapid and steady increase for a number of weeks, followed later by a leveling off period in the rate of improvement of strength. The total length of time one

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1. Hellebrandt, F. A., in DeLorme, T. L., and Watkins, A. L.: Progressive Resistance Exercise: Technic and Medical Application, New York, Appleton-Century-Crofts, Inc., 1951, p. 6.

2. DeLorme, T. L.: Restoration of Muscle Power by Heavy-Resistance Exercises, J. Bone & Joint Surg. **27**: 645 (Oct.) 1945.

should exercise, of course, is based on many individual factors, and these will be discussed further in more detail.

Although very heavy weight loads may be utilized in order to develop potentially strong muscles, such as the quadriceps, techniques have been developed for exercising muscles of poor grade which are unable to move a segment of the extremity against gravity. This has been made possible by methods of counterbalancing or positioning, so that gravity assists the muscle in exercise.

When counterbalancing is necessary, one determines the minimum weights necessary to allow 10 repetitions through full range of motion, and the 10-repetition minimum figure is accordingly determined. In this instance the weight loads are decreased instead of increased until the muscle is strong enough to move the extremity freely against gravity.

In order to get proper results from this method of exercise, it is important that great attention be paid to all details of technique. This includes proper positioning and securing of the patient so that he can comfortably and safely exert a maximum effort. The apparatus used should be of sturdy construction, free of the danger of breaks in equipment, which could cause sudden strains. It should also allow for ease of operation by the therapist and should be standardized so that the same positions and resistances can be obtained from day to day. For this reason several years of research have gone into the design of equipment which has been developed to provide safety, efficiency, and ease of operation. To use such equipment properly, however, requires a period of training and experience by the therapist and thorough familiarity by the physician in order to write a prescription properly. Literature on this subject is now available.[3]

TRAUMATIC CONDITIONS

Historically this method of exercise was first used to develop quadriceps power following injuries around the knee. From the point of view of frequency, progressive resistance exercise for developing power of knee extension is still leading in importance. These resistance exercises have been of proved value in regaining full stability and strength following athletic injuries, such as sprains and strains, and are particularly important in the care of football players. In order to prevent recurrence of knee injuries, one should make certain that quadriceps power is at least equal to that of the normal extremity of the patient, and, for a patient with ligamentous injury, it may be wise to increase the strength above the normal. Experience has shown that this can be done safely with proper technique, in which a well-fitted aluminum boot and securely applied weight is used under the guidance of a trained technician.[4] Similarly, these resistance exercises may be utilized effectively after meniscectomy as soon as healing of the surgical wound has occurred, usually in about two weeks' time.

Good results have also been obtained in increasing knee function both as to range of motion and strength of musculature following fractures of the femoral shaft, including the supracondylar region, and fractures of the tibia requiring immobilization of the knee.[5] In these instances it is safe and effective to give progressive resistance exercises to develop musculature before allowing weight bearing. With limited motion special positioning may be necessary. For example, the patient may do combined hip and knee extension in the sitting position, with adjustment of apparatus to fix range of motion to the limits of the knee at the time, or the patient may exercise in the prone-lying position, with an overhead pulley to which the weights are attached to provide resistance while the muscle is assisted by gravity. It is usually valuable also to exercise the knee flexors, which are frequently subnormal in strength.

Backs.—We all know that the treatment of back strain of traumatic origin, without disc and spinal root lesions, presents a therapeutic challenge. Recurrences are all too common following recovery from acute attacks. One method of approach is to attempt to improve trunk musculature, which is weakened by disuse atrophy during the period of immobilization required by acute symptoms. If the patient must return to a fairly heavy type of work, it is essential that proper trunk musculature be developed, and techniques for utilizing the principle of progressive resistance have been developed. It should be emphasized that it is of utmost importance to have a strong, firm, exercise table and maximum support of the pelvis and lower extremities. Trunk flexion and extension exercises can then be given safely and heavy exercise loads gradually developed to fully strengthen the powerful trunk muscles.

These same exercises may be used to advantage to enable patients to discard back braces and other supports worn for recurrent attacks of back strain on a mechanical or postural basis. This is especially true in the case of women with poor abdominal musculature and habits of little physical activity. In after-care of vetebral fractures, hyperextension exercises can be made more effective by utilizing progressive resistances.

Amputees.—An obvious application of progressive resistance exercise is in developing the strength of the upper extremities for patients with lower extremity amputations and also in developing the strength of muscles of either lower or upper extremity stumps. Passive stretching alone usually cannot be counted on to overcome hip flexion contractures but must be accompanied by strengthening exercises for the hip extensors, and with special adaptation of equipment the principle of progressive resistance may be successfully utilized.

NEUROLOGICAL CONDITIONS

In considering diseases of the nervous system producing muscular weakness, one first of all thinks of anterior poliomyelitis. After several years of study it has been the conclusion of my colleagues and I that this method of exercise has little role in the care of patients during the acute phase of the disease while pain and muscle tenderness are present. We have used progressive resistance exercises during the first three months of convalescence for selected muscle groups in severely involved patients. In view of the known variability in degree and rate of spontaneous recovery of muscle power in this disease,

3. DeLorme, T. L., and Watkins, A. L.: Progressive Resistance Exercise: Technic and Medical Application, New York, Appleton-Century-Crofts, Inc., 1951, p. 245.

4. Gallagher, J. R., and DeLorme, T. L.: Use of Technique of Progressive-Resistance Exercise in Adolescence, J. Bone & Joint Surg. **31-A**: 847 (Oct.) 1949.

5. DeLorme, T. L.; West, F. E., and Shriber, W. J.: Influence of Progressive-Resistance Exercises on Knee Function Following Femoral Fractures, J. Bone & Joint Surg. **32-A**: 910 (Oct.) 1950.

we have been unable to conclude definitely that this method of exercise offers significant superiority over the usual methods of muscle reeducation employed in treatment. It should also be pointed out that for this method of exercise to be effective the patient must be able to cooperate fully and make a maximum muscle exertion, so that it cannot be employed in the treatment of infants and young children.

In later convalescence, when the natural expected recovery rate is slow or minimal, progressive resistance exercise has proved to be valuable for muscles of all grades between poor and good, and there is some evidence to indicate that the partially innervated muscles of the patient with residual weakness from poliomyelitis will respond by increases in strength similar to normal muscles weakened by disuse, although of course the final end result quantitatively will not be the same.[6] One of the most striking examples of the value of such exercise in late convalescence is illustrated by the following case.

In G. S., 27, an insurance salesman, acute poliomyelitis developed in November, 1946, with severe paralysis of the abdominal and back muscles and weakness of both lower extremities, the left being more involved than the right. He was hospitalized for three months, receiving recumbent muscle reeducation. This was continued at home, and by July, 1947, he was learning to use crutches, wearing a left short leg brace. In November, 1948, two years after the onset, he was referred for progressive resistance exercises; he still needed crutches and a short leg brace. His residual paralysis was such that he had no more than a trace of abdominal muscle power and only poor low back extensor musculature. All muscles of the right lower extremity were good to normal, except for the hip muscles, which were in the low fair grade. On the left, hip muscles were in the poor grade and quadriceps was only fair minus.

His progressive resistance program consisted of exercises for both hip and knee flexors and extensors and hip abductors and trunk flexion and extension. He received treatment three to four times a week for over two years, since he continued to show improvement. For example, his left knee extensor exercise load increased from 7½ to 65 lb. (3.5 to 29.5 kg.), his hip flexor, from 30 to 100 lb. (13.6 to 45.4 kg.), and his bilateral abductors, from 25 to 50 lb. (11.3 to 22.7 kg.). To do trunk flexion in the beginning he had to sit at an angle only 12 degrees beyond a right angle in order to do forward bending, and this improved so that he could finally sit up from an elevation of only 15 degrees from the supine position. His trunk extensors in the beginning required 60 lb. (27.2 kg.) of counterbalance, which was reduced to only 20 lb. (9.1 kg.). At the same time with this increase in muscle power, he was able to discard his crutches. He now walks with a nearly normal gait without fatigue and is on his feet freely all day long. Since certain muscles are still showing improvement nearly four years after the onset of his disease, he is still following a moderate resistance exercise program.

Peripheral Neuritis and Nerve Injuries.—Patients with peripheral neuritis, infectious polyneuritis, and peripheral nerve injuries have been found to respond similarly to poliomyelitis patients during the phase of nerve regeneration and beginning return of muscle power. The same techniques are utilized, the rate of improvement being limited by the degree of muscle reinnervation.

Paraplegia.—Progressive resistance exercises for patients with paraplegia are directed toward development of strength of the upper extremities. The use of bar bells is familiar to all those treating these patients and need not be commented on further.

Spastic Paralysis from Upper Motor Neurone Lesions.—Resistance exercises have a limited value in developing weak muscle groups in patients with hemiplegia, multiple sclerosis, and other lesions of the central nervous system causing weakness but not complete paralysis. The stimulus of resistance exercises seems to be of some value in developing better motor patterns as well as improving strength of specific muscle groups. This is ordinarily combined with other types of exercise therapy, such as coordination, balance, and gait training.

MEDICAL CONDITIONS

Arthritis.—One of the commonest conditions met with among our aging population is degenerative joint disease involving the knees, with pain, insecure walking, and difficult stair climbing. At the present time we have no way of reversing these pathological changes, and surgical intervention is usually of value only when loose bodies are present or in removal of areas of extreme hypertrophic changes. Careful examination of these patients will almost universally reveal significant weakness of the quadriceps muscle. I believe that this weakness is an important factor in the occurrence of the symptoms, including difficulty in stair climbing and a sense of impending giving-way of the knee. We have found even in the presence of quite marked x-ray evidence of degenerative changes that the patient can exercise effectively in a nonweight-bearing position, doing knee extension, and, with progressive resistance, increase the quadriceps power to a near normal level.[7] As long as loose fragments or bony overgrowth and pain do not prevent the performance of this exercise, patients can increase strength, sometimes rather slowly, but progressively, so that great functional improvement can be achieved. The number of repetitions may have to be reduced from the usual 10 on each set to 8 or 5, and rest days may be somewhat more frequent. Except when these exercises are obviously not mechanically possible, it is recommended that they be given a trial before using surgical treatment or braces.

Patients with degenerative joint disease of the hip or malum coxae senilis have not responded as favorably to resistance exercises. In most instances, except in the very early stages, pain prevents effective maximum contractions so that satisfactory increases in muscle power are not possible. It is believed, however, that exercises of this type may be used with benefit in the after-care of many patients with "vitallium" (an alloy of cobalt, chromium, and molybdenum) mold arthroplasty. The details of technique for these patients have been described in another article.[8]

The possible utilization of progressive resistance exercises for patients with rheumatoid arthritis has been studied in view of the signal degree of muscular atrophy and weakness so commonly seen. It is evident that resistance exercises must be used with considerable caution in the presence of subacute inflammatory reactions, and not at all in the acute cases. Probably the greatest benefit is obtained in developing quadriceps strength in patients

6. DeLorme, T. L.; Schwab, R. S., and Watkins, A. L.: Response of Quadriceps Femoris to Progressive-Resistance Exercises in Poliomyelitic Patients, J. Bone & Joint Surg. **30-A**: 834 (Oct.) 1948.

7. Watkins, A. L.: Symposium on Recent Advances in Medicine; Physical Medicine in Treatment of Degenerative Joint Disease, M. Clin. North America **33**: 1313 (Sept.) 1949.

8. DeLorme, T. L., and Watkins, A. L.: Progressive Resistance Exercises in Cup Arthroplasties of the Hip, Arch. Phys. Med. **30**: 367 (June) 1949.

prior to ambulation and in patients with relatively inactive disease to aid in overcoming contractures. These exercises should be combined with the usual exercise programs to maintain muscle strength and joint motion of all involved areas.

Disuse Atrophy.—One of the most obvious applications of progressive resistance exercises is for conditioning purposes for normally innervated muscles which have become weak and atrophied due to immobilization in bed. Muscle power may easily be increased and is helpful in preparing the patient for ambulation and fuller physical activities.

Contraindications.—Certain dangers of progressive resistance exercises should be emphasized. In the presence of disease of the coronary arteries, high blood pressure, extensive arterial sclerosis, or other obstructive diseases of the arterial system, increases in intra-abdominal pressure should be avoided, such as may result from heavy resistance exercises. One would also, of course, avoid them in the presence of cardiac decompensation or known thrombophlebitis or phlebothrombosis.

SUMMARY AND CONCLUSIONS

The purpose of progressive resistance exercise is to increase muscle strength rapidly and effectively. It is based on the sound physiological principle that the most adequate stimulus for strengthening muscle is a near maximum voluntary contraction. Details of technique are important, including the use of safe and efficient equipment. Some of the most valuable applications in everyday practice have been described in traumatic, neurological, and medical conditions.

STEREOENCEPHALOTOMY

THALAMOTOMY AND RELATED PROCEDURES

Ernest A. Spiegel, M.D., Henry T. Wycis, M.D.
and
Herbert Freed, M.D., Philadelphia

The exposure of subcortical structures by the classical methods of neurosurgery usually is associated with considerable damage to the overlying cerebral tissue. Nevertheless, therapeutic procedures in the depth of the brain can be carried out with minimum injury to the cerebral hemispheres if needle electrodes are introduced by means of an apparatus that permits the exact regulation of their position, direction, and depth. The apparatus we devised, the stereoencephalotome (SET),[1] is an adaptation to the human brain of the so-called stereotaxic method used by Horsley and Clarke [2] in animal experiments. Our apparatus consists of a base and a frame (Fig. 1). The base (B) is anchored to the skull in a position parallel to Reid's base line by various plugs and auxiliary holders. On the frame (F) the needle carrier is fixed which can be moved in any plane and direction.

In order to place the lesions correctly regardless of the shape of the skull, it is necessary to refer the coordinates of the stereoencephalotome to a point within the cerebrum: the pineal body if calcified, or structures around the third ventricle or aqueduct (e. g., posterior commissure) visualized by pneumoencephalography (Fig. 2).

Preoperatively an x-ray is taken of the patient with the apparatus in situ. Its contact points with the scalp are tattooed so that exact reapplication at the operation is possible. From the x-ray films the relationship of the electrode to the reference point (pineal body, posterior commissure) is determined, and from these data and an atlas giving the distances of subcortical structures from these reference points the coordinates of the electrode tip required for a certain lesion are calculated. The electrode is inserted to the desired position through a trephine hole. The lesions are produced by electrolysis; the bare tip of the otherwise insulated needle electrode is the anode, an indifferent plate electrode the cathode.

In the last four years we have collected experiences with the application of this method in the treatment of the following conditions:

1. Mental disorders with chiefly emotional disturbances (58 cases).
2. Unbearable pain (24 cases).
3. Involuntary movements (7 cases).
4. Petit mal attacks (6 cases).
5. Subcortical tumors; preliminary studies have been carried out with Dr. M. Spiegel-Adolf in developing a method for treatment of these tumors by injection of radioactive substances.

MENTAL DISORDERS

Small circumscribed lesions were placed in thalamic nuclei, in the majority of our patients in the dorsomedial nuclei (dorsomedial thalamotomy), in some instances in the anterior nuclei (anterior thalamotomy), or in the lateral part of the posterior hypothalamus (hypothalamotomy). We attempted in this way to interfere with the circuits underlying emotions and to obtain the beneficial effects of the psychosurgical procedures on the frontal lobe (lobotomy, topectomy, transorbital leucotomy), but without some of their undesirable by-effects such as interruption of cerebral association systems.

Fifty-eight patients, mostly institutionalized for schizophrenia, depression, or severe compulsion neuroses, have been operated on. Most of these patients were

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1. Spiegel, E. A.; Wycis, H. T.; Marks, M., and Lee, A. J.: Stereotaxic Apparatus for Operations on the Human Brain, Science **106**: 349, 1947. Spiegel, E. A.; Wycis, H. T., and Freed, H.: Symposium: Psychosurgery, Thalamotomy: Neuropsychiatric Aspects, New York J. Med. **49**: 2273, 1949. Spiegel, E. A., and Wycis, H. T.: Physiological and Psychological Results of Thalamotomy, Proc. Roy. Soc. Med. **42**: 84, 1949.

2. Horsley, V., and Clarke, R. H.: The Structure and Functions of the Cerebellum Examined by a New Method, Brain **31**: 45, 1908.

under psychiatric treatment for a period of from 1 to 17 years, and had also been subjected to the various shock therapies without relief. In four patients prefrontal or transorbital lobotomies had been performed at other institutions without alleviating the disturbances, or the patients had relapsed after initial improvement.

A total of 90 operations were performed in 58 patients, since some operations were performed in several stages, and in some patients an operation was performed again. Postoperative death occurred in two patients, so that the case mortality was 3.4%, the operative mortality 2.2%.

In patients in whom the operation was successful, beneficial effects on pathologic symptoms were obtained chiefly in the emotional sphere. The patients' anxiety,

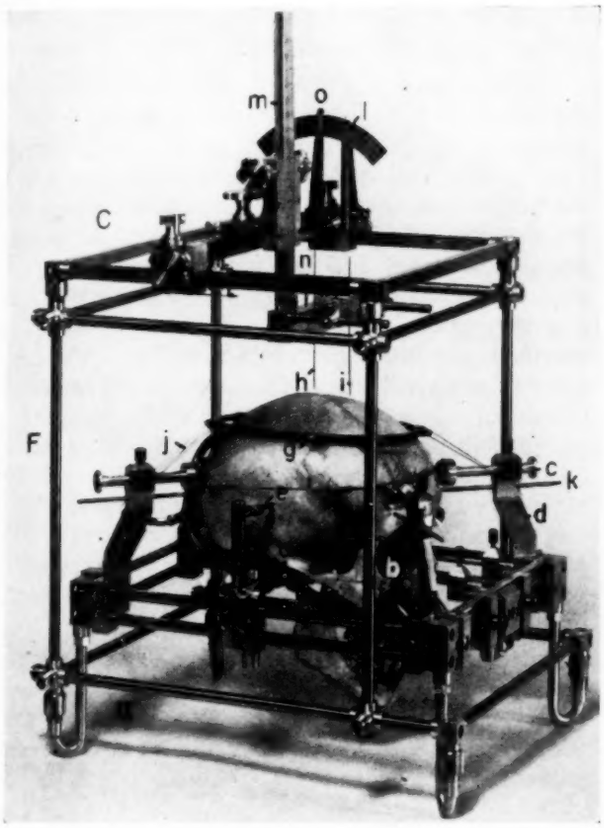

Fig. 1.—Stereoencephalotome: *B*, base; *F*, frame; *C*, electrode carrier; *a*, ear plugs; *b*, orbital bar; *c*, rubber cushioned stop; *d*, support for *c*; *e*, graduated pin; *f*, maxillary support; *g*, ring; *h*, *i*, electrodes; *j*, string (now replaced by graduated steel tape); *k*, graduated pin; *l*, protractor; *m*, upright bar of electrode holder; *n*, transverse bar of electrode holder; *o*, pointer of protractor.

tension, and worry disappeared, or were at least definitely reduced. The patients became more easily manageable; their agitation, and aggressive or assaultive behavior subsided. Hallucinations lost their emotional charge and, occasionally, even disappeared. The same applied to paranoid ideas. Obsessive thinking also lost its force, and compulsive activity disappeared.

Of 43 patients observed for one-half to four years after thalamotomy, 11 (25.6%) are at home with nearly full (7) or reduced (4) working capacity, and 11 (25.6%) are more easily manageable in the hospital, while 8 (18.6%) were only temporarily improved, and 13 (30.2%) were not benefited. In cases of relapse after lesion of the dorsomedial nuclei, additional lesions in the anterior nuclei and/or in the hypothalamus proved beneficial. Apparently there is a multiple representation of emotional reactions in the diencephalon.

The undesirable by-effects and sequelae of thalamotomy are distinctly less pronounced than those following operations on the frontal lobes. Memory defects, disorientation particularly for time, diminution of initiative, and slowness of response were present for some weeks after operation. In three schizophrenic patients there was a transient increase of sexuality and aggressive behavior lasting a few weeks. Undesirable effects of long duration appeared in single instances only, namely, memory defects of several months' duration and reduction of initiative. Untidiness was observed in a woman who had been subjected to frontal lobotomy preceding the thalamotomy, suggesting the possibility of a combined effect of the two operations. In none of our patients did we observe such sequelae of frontal lobotomy as facetiousness, lack of tact or discipline, distractibility, profanity, outbursts of temper, or childish behavior.

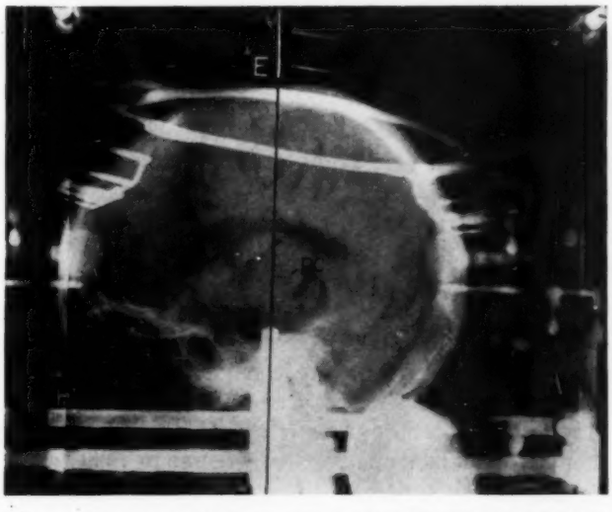

Fig. 2.—Pneumoencephalogram with stereoencephalotome in position. Electrode (E) in zero position (intersection of median sagittal and interaural planes). Distance (dotted line) of the posterior commissure (pc) from the E line is determined, as well as distance from the surface of the brain.

A statistical analysis of the results obtained with the Wechsler-Bellevue Intelligence Test failed to show significant alterations. A comparison of preoperative and postoperative Rorschach studies failed to show signs of increased organic involvement after thalamotomy.

We observed only once an epileptiform seizure that followed an orbital infection in a patient several weeks after repetition of an operation (hypothalamotomy). In none of our patients was more than a single seizure observed. Electroencephalographic studies also failed to show the development of a convulsive hyperreactivity.

For an evaluation of the various psychosurgical procedures, cases are of interest in which thalamotomy preceded or followed operations on the frontal lobe. We have two observations of the first type and four of the second. In the first group is one of our earliest patients, a woman with an obsessive-compulsive neurosis in whom, following the production of very small electrolytic lesions of the dorsomedial nuclei, there was no definite change. Two months after the thalamotomy, a psychiatrist per-

formed a transorbital lobotomy, apparently with favorable results. However, it seems difficult to compare the effect of the two procedures, since the transorbital lobotomy was carried out before the long range effects of the thalamotomy were established. In a second patient, a severe anxiety state (borderline schizophrenia) persisted after the thalamotomy, and also after the frontal lobotomy.

In the second group (thalamotomy following frontal lobe operations) was one schizophrenic in whom prefrontal lobotomy as well as thalamotomy were inefective.[2a] In three patients, one with obsessive-compulsive neurosis, one with severe anxiety neurosis, and one with paranoid schizophrenia, thalamotomy improved the patient's condition while the frontal lobe operations (standard or transorbital lobotomy) had failed or had only a transitory effect. This was particularly striking in the patient with severe anxiety neurosis in whom relapses had occurred despite two prefrontal lobotomies. These experiences are not only of practical but also of theoretical interest; they point to the importance of diencephalic systems in the mechanism of emotions.

UNBEARABLE PAIN

In patients with pain refractory to conservative treatment and even neurosurgical measures, we have performed various procedures: (1) interruption of the pain-conducting systems (spinothalamic, quintothalamic tracts, and adjacent systems in the reticulate substance at the level of the superior colliculi, mesencephalotomy), (2) lesion of their thalamic endings in the nucleus ventralis posterolateralis (ventrolateral thalamotomy), and (3) combination of mesencephalotomy with lesion of the dorsomedial nuclei (mesencephalothalamotomy).[3] The latter procedure was performed particularly in patients with marked emotional reaction to pain.

Our case material consists partly of patients suffering from pain due to inoperable malignancy, partly of patients in whom the pain was due to other causes, such as atypical facial neuralgia not relieved by retrogasserian rhizotomy, postherpetic neuralgia, neuroma, gastric crises, and post-traumatic and thalamic pain. In some of these patients other neurosurgical procedures such as rhizotomy, sympathectomy, and even prefrontal lobotomy had been performed in other institutions without relieving the patient.

Since the main portion of the spinothalamic systems crosses the midline, unilateral mesencephalotomy, just as unilateral chordotomy, is able to abolish or diminish pain caused by a process that is localized in the opposite half of the body. Due to the existence of an uncrossed bypath, however, it is often necessary to sever the spinothalamic tracts bilaterally in order to avoid a recurrence of the pain. Bilateral mesencephalotomy is indicated particularly when one deals with pain originating in internal organs, e. g., in visceral malignancy or gastric crises, since the homolateral conduction of pain plays a still more important role in such cases than in those in which pain originates in superficial structures.

In five of the seven surviving patients with pain due to malignant tumors, mesencephalotomy at least reduced the pain sufficiently so that the use of analgesics could be discontinued or their dosage reduced. In two patients sufficient relief was not obtained, apparently because the pain-conducting pathways had not been interrupted bilaterally.

In two patients with atypical facial neuralgia retrogasserian rhizotomy had failed to abolish pain, which persisted in one patient for seven years, in the second for 10 years, preceding mesencephalothalamotomy. This procedure resulted in practically complete relief in both patients which has been maintained for three and one-half and two years, respectively.

In five patients with thalamic pain interruption of the pain-conducting pathways in the midbrain definitely reduced or nearly abolished the pain in two. This was particularly dramatic in a patient with thalamic pain in the face in whom retrogasserian rhizotomy, resection of the opposite cortical sensory face center, and homolateral prefrontal lobotomy had been tried unsuccessfully. However, with the return of pain conduction apparently along accessory pathways, the pain reappeared after four months in the first patient, and after five weeks in the second. Lesions of the nucleus ventralis posterolateralis in two other patients definitely reduced the spontaneous pain and the dysesthesia experienced by the patient on cutaneous stimulation before operation. This effect has at the time of writing been maintained for four and one-half months in the one, and for four months in the other patient. In a third patient the operation on the nucleus ventralis posterolateralis brought relief for a few weeks only.

In a 74-year-old man suffering from postherpetic pain in the left arm, right mesencephalotomy produced complete hemianalgesia and abolished the superficial pain, while the deep seated pain persisted. The case was complicated by drug addiction.

Just as after chordotomy, one may observe that after mesencephalotomy the original pain is diminished or subsides but paresthesias appear. This was noted in a patient with an amputation neuroma and in two patients with pain persisting after disk operations. In one of these patients chordotomy had been performed previously and paresthesias had appeared after the spinal operation also. In a third patient with pain persisting after a disk operation there was a definite but transient relief from pain following mesencephalotomy. In a patient with spinal trauma who was suffering from pain in the leg, this pain persisted despite several disk operations, i. e., rhizotomy, sympathectomy, chordotomy, and intraspinal alcohol injection. Mesencephalotomy produced at least a reduction of the painful area. In these two patients bilateral lesions of the dorsomedial nuclei were added; this produced in the last-mentioned patient a transient state of "not caring about the pain," and the other patient no longer complained about the pain for the observation period of nearly one year.

2a. Several months after thalamotomy and subsequent electroshock treatments, this patient showed definite improvement.

3. Wycis, H. T., and Spiegel, E. A.: Symposium: Psychosurgery; Thalamotomy and Mesencephalothalamotomy: Neurosurgical Aspects (Including Treatment of Pain), New York J. Med. **49**: 2275, 1949.

A patient with apparent Dercum's disease (adiposis dolorosa), whose pain in the shoulder and arm persisted despite two rhizotomy operations, seemed to be relieved after an extensive mesencephalotomy; but the follow-up period has been too short to allow definite conclusions.

In a tabetic patient suffering from gastric crises that had not been relieved by bilateral prefrontal lobotomy, these attacks ceased following bilateral mesencephalotomy, which produced an analgesia of the whole body. Nine weeks later pain sensation returned in the right half of the body. This was accompanied by a reappearance of the crises, so that another operation, on the left side, will be necessary.

Morbidity and Mortality.—Regarding the by-effects of the operation, one has to remember that at the level of the superior colliculi the spinothalamic tract lies close to the auditory pathways. Since the puncture is made from the dorsal aspect, there is a better chance to avoid injury to the auditory system that lies lateral to the spinothalamic tract than if one makes an incision through the lateral surface of the midbrain as in Walker's [4] mesencephalic tractotomy. However, in single instances the lesion may encroach on the cochlear tract and there may be a constriction of the hearing field and transitory subjective auditory sensation such as buzzing in the opposite ear. The oculomotor nuclei and roots fortunately are sufficiently distant from the spinothalamic tract so that they are only occasionally partly affected.

Bilateral puncture may encroach on the center for upward gaze in the gray matter around the aqueduct or its cortical connections so that upward movement of the eyeballs may be impaired. This disturbance, however, rarely produces a significant inconvenience. In one patient we observed intentional tremor due to encroachment on the nucleus ruber-brachium conjunctivum system. This existed for a few weeks only.

Two patients with carcinoma died within a week after operation. These patients were poor operative risks due to their advanced cachectic state. In one hypertensive patient with a thalamic syndrome the blood pressure rose during the operation to 240 and apparently an intracerebral hemorrhage occurred. The patient died five weeks postoperatively, from bronchopneumonia. Thus the case mortality for this group of 24 patients is 12.5%, the operative mortality (39 operations) 7.7%.

An important point to be considered is the problem of remaining or recurrent pain which is due to the existence of various bypaths (chains of short neurons in the reticulate substance). The question arises how to treat the pain due to this remaining conduction outside the spinothalamic system. Cutting of the frontothalamic connections in prefrontal lobotomy eliminates the emotional component and the anxiety associated with pain (Freeman and Watts). We were able to influence emotional disturbances by thalamotomy, avoiding most of the undesirable by-effects of the frontal lobe operations. We combined, therefore, in some cases mesencephalotomy with thalamotomy (so-called mesencephalothalamotomy) in order to diminish the emotional reactivity of the patient to pain impulses that still may reach the higher centers by way of the above-mentioned bypaths. A comparison of two patients may help to throw some light on this problem. In the above-mentioned patient, suffering from pain in the leg following spinal trauma, the pain apparently was not accompanied by a definite emotional component. Thalamotomy produced only a transitory inattention to pain, and within a few weeks the patient's complaints returned. In another patient suffering from atypical facial neuralgia persisting despite retrogasserian rhizotomy there was a definite emotional factor. Contralateral mesencephalothalamotomy produced a transitory hemianalgesia. Despite the regression of this hemianalgesia, the pain of the patient did not return except for occasional paresthesias. Apparently thalamotomy combined with mesencephalotomy had diminished the patient's emotional reactivity to remaining pain impulses to such a degree that she could be considered practically cured. Whether mesencephalotomy should be performed alone, or whether it should be combined with thalamotomy, apparently depends on the degree of associated emotional reactions.

CONVULSIVE DISORDERS OF SUBCORTICAL ORIGIN

The stereotaxic method permits one to approach the question whether certain types of convulsive disorders such as petit mal seizures may have a subcortical component. In patients suffering from grand and petit mal attacks or petit mal only, the electrical discharges from the thalamus (electrothalamogram or ETHG) were recorded during operation by means of needle electrodes introduced by the stereoencephalotome. We observed three types of reaction:

1. The discharges appeared simultaneously in the cortex and in the diencephalon.

2. The discharges (spikes or spikes and slow waves) remained limited to the thalamic leads, while the electrocorticogram recorded by scalp electrodes failed to show abnormal potentials.

3. The seizure discharges first appeared in the thalamus, then these abnormal thalamic discharges were accompanied by similar ones in the frontal leads, and finally the thalamic seizure discharges outlasted those in the frontal lobe.

A fourth type, spread of a cortical discharge to the thalamus, was observed by Meyers and others [5] in a study including other types of convulsive disorders.

The seizure discharges are not limited to the region of the internal lamina medullaris on stimulation of which Jasper [6] was able to elicit spike-and-dome patterns in the electroencephalogram, but they may have the maximum amplitude in distant parts such as the more dorsal areas of the thalamus or the hypothalamus.

We placed lesions in the areas of abnormal thalamic discharges in patients suffering from petit mal or from grand and petit mal attacks with predominance of the latter type of seizures in the hope of influencing this latter component. Our experiences with the latter operation (six patients refractory to the usual medication) are too small to warrant definite conclusions regarding

4. Walker, A. E.: Relief of Pain by Mesencephalic Tractotomy, Arch. Neurol. & Psychiat. **48**: 865, 1942.

5. Meyers, R.; Knott, J. R.; Hayne, R. A., and Sweeney, D.-B.: The Surgery of Epilepsy: Limitations of the Concept of Cortico-Electrographic "Spike" as Index of Epileptogenic Focus, J. Neurosurg. **7**: 337, 1950.

6. Jasper, H. H., and Droogleever-Fortuyn, J.: Experimental Studies on the Functional Anatomy of Petit Mal Epilepsy, A. Res. Nerv. & Ment. Dis., Proc. **26**: 272, 1947.

the effectiveness of this procedure. We did not succeed as yet in abolishing the petit mal seizures completely; however, at least in two of five patients observed for a period of from one to three years, there was a definite reduction in the number of petit mal attacks (in one patient from a monthly average of 20 to 6; in a second from a monthly average of 150 to 1). In the last-mentioned patient there was also a diminution of the severity of the associated motor phenomena (such as facial twitching, shaking of the head) and of the disturbance of consciousness. In a sixth patient the observation period was too short to permit a statement, although the duration of the single attacks apparently had diminished. Our experiences seem to justify the conclusion that, at least in a certain group of patients with petit mal, a subcortical component plays a part; however, relatively large areas of the thalamus seem to be affected so that lesions of relatively large parts of this ganglion would be necessary in order to abolish petit mal seizures completely.

INVOLUNTARY MOVEMENTS IN CHOREA AND ATHETOSIS

Two new approaches have been devised for the surgical treatment of involuntary movements: lesions of the dorsomedial nuclei of the thalamus (thalamotomy), and lesions of the globus pallidus (pallidotomy).

Thalamic Lesions.—It is well known that afferent stimuli, and particularly emotions, are able to accentuate these involuntary movements. Since we had observed that lesions of the dorsomedial nuclei were able to diminish emotional reactivity, and since Papez [7] described fibers originating in the dorsomedial nucleus and projecting to the globus pallidus, it seemed worthwhile to ascertain whether lesions of the dorsomedial nuclei would diminish choreic and athetotic movements. Electrolytic lesions of the dorsomedial nuclei significantly reduced the involuntary movements in but one of four patients, a 53-year-old man who suffered from jerky choreiform movements involving the entire musculature bilaterally. Since an older sister had twitching of the shoulders, Huntington's chorea was diagnosed. Large electrolytic lesions of the left dorsomedial nucleus diminished the hyperkinesis on the right side particularly of the right hand. A similar lesion of the right dorsomedial nucleus reduced the hyperkinesis of the left side, again chiefly in the hand. The movements of the head were not influenced. The reduction of involuntary movements was sustained for a little over a year.

In two additional patients with Huntington's chorea, lesions of the dorsomedial nuclei were ineffective, perhaps due to the lack of emotional factors. In a boy suffering from cerebral palsy and athetosis following birth trauma, the reduction of the involuntary movements on the side opposite the thalamic lesion lasted only a few days.

Pallidal Lesions.—Numerous pathological experiences indicate that lesions of the globus pallidus or of the substantia nigra, ganglia where extrapyramidal motor fibers originate, are associated with hypokinesis, at least in the great majority of the patients. Thus it may be expected that production of small lesions in these ganglia may counteract some types of hyperkinesis.

We attempted to produce a lesion of the right substantia nigra in a single patient only. This was a 71-year-old patient with cerebral arteriosclerosis and arteriosclerotic heart disease in whom hemiballism had developed in the left arm following a cerebrovascular accident. After operation the involuntary movements did not return. Unfortunately, bronchopneumonia and renal failure developed postoperatively and the patient died five weeks after operation. The autopsy revealed a circumscribed electrolytic lesion in the medial part of the right substantia nigra besides old softenings in the region of the corpus subthalamicum and the lateral nucleus. Lesions of the globus pallidus (pallidotomy) were produced in five patients.

The pallidum can be reached by an oblique puncture through the frontal lobe sparing the corticifugal system to the cranial nerves and the pyramidal tract. Since injection of 1 drop of 50% alcohol into this ganglion proved insufficient, we eventually produced electrolytic lesions of the pallidum. Small lesions in its most anterior parts were ineffective. Large lesions including the medial part of the pallidum are dangerous because they may encroach on the pyramidal tract. This was shown in one patient in whom a hemiplegia developed after an extensive pallidal lesion. In four patients (three with Huntington's chorea, one with electric chorea) we tried, therefore, to spare the most medial part of the pallidum, and placed the lesions in the lateral segment of the pallidum only. In the patient with electric chorea a unilateral pallidal lesion did not diminish the lightning-like jerking that affected the whole body. In two of the three patients with Huntington's chorea bilateral lesions of the pallidum, usually produced first on the right and later on the left side, were able to reduce or nearly abolish the involuntary movements, particularly in the extremities. In the third patient a reduction of the choreatic movements was obtained on the right side only. An abstract case report of the patient who has been observed for the longest period follows.

A 63-year-old Negro suffered for two and a half years from involuntary bizarre generalized movements that became progressively worse. Three brothers had a similar condition. There was an inconstant bilateral Hoffman's sign. Blood and spinal fluid Wassermann were +4. Large electrolytic lesions of the left dorsomedial nucleus and a small lesion of the anterior tip of the right pallidum failed to influence the involuntary movements. After extensive electrolytic lesions produced in the lateral part of the right pallidum (second operation) the involuntary movements ceased on the left side. A slight left-sided hemiparesis developed affecting particularly the left leg. Two weeks after operation there was a definite return of power of the voluntary movements. The choreiform movements did not reappear except for some twitching in the left frontalis muscle. Similar electrolytic lesions in the external part of the left pallidum (third operation) abolished the choreiform movements on the right side except for slight movements of the toes. Transitory slight weakness developed in the extremities of the right side, without Babinski's sign. Three months after a left pallidotomy and five months after a right pallidotomy the patient showed only on the left side a weakness of the extremities with increase of the deep reflexes and a Hoffman's sign. On the right side voluntary movements could be performed rather well and with normal power. The only sign of an injury to the pyramidal tract on the right side was a positive Hoffman's sign. However, this sign had been

7. Papez, J. W.: Fiber Connections of the Basal Ganglia, A. Res. Nerv. & Ment. Dis., Proc. 21: 21, 1942.

positive bilaterally before operation. The only involuntary movements noticeable were a slight jerking of the shoulders, extensor-flexor movements of the thumb, and extensor movements of the toes on the right side. Muscular rigidity did not develop, probably because circumscribed lesions had been produced, leaving parts of the pallidum intact. Seventeen months following the second operation the patient's improvement has been sustained. The only residual is a mild weakness of the left lower limb. The choreatic movements have not returned despite the known progressive character of the disease.

Thus lesions of the pallidum are able to eliminate nearly completely violent choreatic movements of Huntington's chorea on the side opposite the operation. The question arises as to whether the cessation of the involuntary movements is due to the pallidal lesion or to unintended by-effects on corticifugal fibers of the internal capsule injured directly by the electrolysis or indirectly by thrombosis of vessels passing through the pallidum. In this respect the effect of the left-sided pallidotomy in the last cited case is of interest. Signs of pyramidal injury subsided within a short time. At a stage when voluntary motility of the right side was nearly normal, the choreic movements were still absent except for slight jerking limited to the shoulder, the thumb, and the toes of the right side. It seems, therefore, justified to relate the cessation of involuntary movements chiefly to the pallidal lesion.

These experiences seem to support, at least for a large group of chorea patients, those theories which attribute to the pallidum an essential role in the efferent innervation of the involuntary movements. However, it should be emphasized that some types of chorea, such as electric chorea, apparently are not benefited by pallidal lesions. It seems hardly necessary to mention that the mental changes in patients with Huntington's chorea, which are due to cortical impairment, are not influenced by pallidotomy. We only wish to infer from this series that in a group of choreas such as Huntington's chorea circumscribed pallidal lesions are able to reduce or to nearly abolish the involuntary movements while the voluntary innervation remains preserved.

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CONTROL OF BONE LENGTH

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Inequalities of bone length are an important cause of deformity of the human body. Shortness of an arm can be disguised satisfactorily by the clothing and is of little significance. A discrepancy in leg length produces a definite disability. Until the advent of anesthesia this deformity could be successfully treated only by the use of a high shoe or some prosthetic appliance. Although some of these gadgets were ingenious, they were always unsightly.

Rizzoli [1] of Bologna was probably the first to equalize leg length deliberately. In 1845 he permitted the fragments of a fractured femur to override 3 in. so that the length was equal to that of the other femur, which had been short for 20 years because of a fracture. Impressed by the ease of this procedure, two years later he produced a fracture of the femur with an osteoclast which he devised. By permitting overriding of the fragments in this 9-year-old girl and then applying a stiff dressing, he equalized shortening which had been produced on the opposite side by a fracture during infancy. He used the method again successfully on a 16-year-old girl with an unreduced traumatic dislocation of the hip.

Rizzoli's successor, Codivilla, shortened a femur by open operation; more important, he lengthened a short tibia. Any operation to shorten the one sound leg has always been open to objection, and even before Codivilla there had been attempts to lengthen the short leg. Overriding, partially united fractures were rebroken and pulled down with skin traction. But sloughing of the soft tissues of the heel and dorsum of the foot was the rule, and the method was considered impractical until Codivilla pulled directly on a pin in the calcaneus. He had an ingenious extension device with slotted bars and wing nuts at the end of a plaster cast. When he reported the method in this country in 1904,[2] he emphasized the fact that the soft parts, and particularly the blood vessels and nerves, could not be lengthened as readily as the bone.

In 1913 Magnuson [3] published a paper on experimental one-stage lengthening of the femur with a step-cut osteotomy. A 32-lb. (14.5 kg.) pull was sufficient to get ¼ to ½ in. (0.6 to 1.3 cm.) lengthening of a dog's femur. Length was maintained by immediate fixation with ivory screws. In another paper Magnuson [4] reported 14 cases of femoral lengthening by his method, with temporary toe drop in 3 cases and death from shock in 1. Bone lengthening did not become popular.

From the Milwaukee Children's Hospital.

This paper is a revision of Dr. Blount's chairman's address read in the Section on Orthopedic Surgery at the One-Hundredth Annual Session of the American Medical Association, Atlantic City, June 14, 1951.

1. Rizzoli, F., and Taruffi, C.: Accavallamento dei frammenti d'una recente frattura del femore destro, procurato dal Prof. Rizzoli, onde togliere il difetto del zoppicare rimasto in sequito di antica frattura del femore sinistro, Bull. d. Sc. Med. di Bologna **9**: 39, 1846. Rizzoli, F.: Das Uebereinanderschieben der Fragmente einer zufälligen oder absichtlichen Fraktur des Femur zur Behebung des Hinkens, welches durch unverbesserliche Verkürzung des entgegengesetzten Beines bedingt wird, Wien. med. Wchnschr. **19**: 1238, 1869. Rizzoli, F.: Frattura artificiale acclavallata del femore destro per togliere una claudicatione a sinistra (Session of Nov. 9, 1871), Memorie della Accademia della Scienze dell' Instituto di Bologna **3**: Serie 1, 1871.

2. Codivilla, A.: On the Means of Lengthening in the Lower Limbs, the Muscles and Tissues Which Are Shortened Through Deformity, Am. J. Orthop. Surg. **2**: 353, 1905.

3. Magnuson, P. B.: Lengthening Shortened Bones of the Leg by Operation, Ivory Screws with Removable Heads as a Means of Holding the Two Bone Fragments, Surg., Gynec. & Obst. **17**: 63, 1913.

4. Magnuson, P. B.: Lengthening Shortened Bones of the Leg by Operation, Ivory Screws with Removable Heads as a Means of Holding the Two Bone Fragments, Pennsylvania Univ. M. Bull. **21**: 103, 1913.

5. Taylor, R. T.: Shortening Long Legs and Lengthening Short Legs; a New Surgical Procedure, Am. J. Orthop. Surg. **14**: 598, 1916.

At the same time R. T. Taylor [5] and A. R. Shands [6] observed that shortening the long leg was easier than lengthening the short one. Calvé [7] published his somewhat complicated methods of femur shortening in 1918. He achieved as much as 4-cm. shortening and maintained the position by dovetail or tongue-and-groove approximation of the ends of the femur.

There were very few attempts at bone lengthening during this period. Improvements in the technic were published by Codivilla's successor, Putti, in 1921 [8] and by Abbott in 1927 [9] and 1928.[10] In 1936 Abbott and Saunders [11] offered a refined technic of leg lengthening. Meticulous but extensive dissection was carried out preliminary to four pin traction and distraction. Although Abbott warned in detail of the complications which might ensue, his splendid paper stimulated many to attempt leg lengthening.[11] There were some disasters, including nonunion, increased paralysis, deformity, and even loss of the leg. In general, bone lengthening was a hazardous procedure,[12] painful to both the patient and the surgeon. There are occasional relative indications. Intramedullary fixation facilitates the procedure but does not materially reduce the hazard.[13]

Leg shortening was a more direct approach to the problem and again the pendulum swung toward this procedure. It was associated with fewer complications, but the operation was still one of considerable magnitude. The technic was simplified by J. Warren White [14] in 1935. After a transverse osteotomy overriding was maintained by two pins incorporated in plaster, which were withdrawn after eight weeks.

6. Shands, A. R.: Shortening of the Long Leg, Internat. J. Surg. **30**: 273, 1917.

7. Calvé, J., and Galland, M.: A New Procedure for Compensatory Shortening of the Unaffected Femur in Cases of Considerable Symmetry of the Lower Limbs, Am. J. Orthop. Surg. **16**: 211, 1918.

8. Putti, V.: The Operative Lengthening of the Femur, J. A. M. A. **77**: 934 (Sept. 17) 1921.

9. Abbott, L. C.: The Operative Lengthening of Tibia and Fibula, J. Bone & Joint Surg. **9**: 128, 1927.

10. Abbott, L. C., and Crego, C. H.: Operative Lengthening of Femur, South. M. J. **21**: 823, 1928.

11. Abbott, L. C., and Saunders, D. M.: The Operative Lengthening of the Tibia and Fibula, Ann. Surg. **110**: 961, 1936.

12. Brockway, A.: Clinical Résumé of Forty-Six Leg Lengthening Operations, J. Bone & Joint Surg. **17**: 969, 1935.

13. Bost, F. C.: Personal communication to the authors.

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16. Phemister, D. B.: Operative Arrestment of Longitudinal Growth of Bones in Treatment of Deformities, J. Bone & Joint Surg. **15**: 1, 1933.

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18. Hatcher, C. H.: Operative Orthopaedics, St. Louis, Mosby, 1939, ed. 1, p. 953.

19. Gill, G., and Abbott, L. C.: Practical Method of Predicting the Growth of the Femur and Tibia in the Child, Arch. Surg. **45**: 286, 1940.

20. Green, W. T., and Anderson, M.: Experiences with Epiphyseal Arrest in Correcting Discrepancies in Length of the Lower Extremities in Infantile Paralysis, J. Bone & Joint Surg. **29**: 659, 1947.

21. Barr, J. S.; Lingley, J. R., and Gall, E. A.: Effect of Roentgen Irradiation on Epiphyseal Growth; Experimental Studies upon Albino Rat, Am. J. Roentgenol. **49**: 104, 1943.

22. Judy, W. S.: Attempt to Correct Asymmetry in Leg Length by Roentgen Irradiation; Preliminary Report, Am. J. Roentgenol. **46**: 237, 1941.

23. Harris, R. I.: Effect of Lumbar Sympathectomy on Growth of Legs Shortened from Anterior Poliomyelitis; Preliminary Report, J. Bone & Joint Surg. **12**: 859, 1930.

24. Friberg, S.: Personal communication to the authors.

25. Blount, W. P.; Schaefer, A. A., and Fox, G. W.: Fractures of Femur in Children, South. M. J. **37**: 481, 1944.

Ollier [15] is generally recognized as the first to arrest growth. He destroyed or resected what was left of the distal epiphyseal plate of the tibia and excised one or both epiphyseal cartilages of the fibula in the correction of varus deformity at the ankle. In 1932 Phemister [16] reported the arrest of longitudinal growth of bone by a new method. He curetted and grafted one epiphyseal plate of a long bone at the time indicated by a composite growth chart. The operation was of less magnitude, and it did not carry as much risk of complication as the previous ones. Failure to stop growth on one side of the bone occasionally caused angular deformity. Mistakes in estimating the future growth resulted in inadequate or excessive correction.

A successful epiphyseal arrest operation requires an accurate prediction of the future growth of the patient's bones. Baldwin,[17] Hatcher,[18] Gill and Abbott,[19] Green and Anderson,[20] and other investigators have contributed growth studies and have compiled growth tables and graphs. Even if one allows for familial tendencies, habitus, and bone age, these are only approximations. They must rely on actuarial computations based on averages. Most surgeons are happy if they come within 1 in. of the desired result. However, these growth studies are the basis for the prognosis in any growth control operation. Their principles must be understood before any of the procedures mentioned in this paper is undertaken.

Roentgen radiation of the epiphyses has produced retardation of growth somewhat proportional to the amount of radiation. Barr [21] and his associates found that large doses completely stopped growth of the tibial epiphyses of albino rats; moderate doses retarded it. They and others [22] tried roentgen radiation on the epiphyses of children. The method was discarded because the results were not dependable, and there was the hazard of soft tissue damage.

STIMULATION OF GROWTH

The acceleration of growth by sympathectomy has been advocated by Harris.[23] The increment obtained after this operation is usually too small to be of practical importance unless there is some clinical evidence of associated vasomotor disturbance. Recently in Sweden an arteriovenous aneurysm has been created surgically in order to stimulate the growth of a short leg.[24] Acceleration has been produced, but the probable cardiac changes make the method hazardous. The end results are not yet available.

Post-traumatic acceleration of growth is well recognized, but the results are not predictable. After a fracture of the femur in a child between 6 and 10 years of age, the average overgrowth is 1 cm. Sometimes the bone remains the same length. Sometimes the relative length is increased as much as 2 or 3 cm. The result is apparently independent of the type of the fracture or its relationship to the epiphysis.[25] The surest way to obtain increased length is to manipulate the bone after four or five weeks, so as to stimulate the formation of exuberant callus. In practice, if osteotomy or osteoclasis is indicated because of bowing or some other deformity, the operation may be counted on for some temporary acceleration

of growth. Pease [26] has called attention to the fact mentioned by von Langenbeck,[27] but often overlooked, that the growth of the tibia distal to a fractured femur is sometimes more rapid.

If overgrowth of a bone is due to a fracture or other local injury, the acceleration will persist only while the stimulating factor operates, and then growth will continue at a normal rate. The increase in length is usually permanent. It is physiological—not "compensatory." There is no "equalizing force" within the body which will retard growth later. It is true that the epiphyseal plate which has been stimulated by disease, fracture, or operation will usually close a few months prematurely. This may reduce the relative length of an overgrown bone. However, in the few months that the epiphysis of the opposite leg remains open after one has closed prematurely, there is usually very little growth on the opposite side.

Juxtaepiphyseal curetting and other bone operations occasionally produce significant acceleration of growth,[28] but the results vary greatly. Many men have attempted to stimulate the growth of bone in small animals.[29] Implanting all manner of foreign bodies and noxious material at the metaphyses produced enough reaction in some cases to injure the epiphyseal plate and retard growth. In only a very few cases was any stimulation produced.[30] But small animal experimentation is futile in the evaluation of stimulation in humans. In 1869 von Langenbeck [27] increased the rate of growth of the left femur and tibia of a puppy with ivory pegs. Ollier [15] obtained the same effect in the tibia of a child with lead nails in 1889. Pease [26] implanted metal and ivory screws at the metaphyses and produced considerable acceleration of the growth of both tibia and femur. He recommends the implantation of ivory blocks. We have recently found this effective.

While looking for a method of stimulating growth, Haas discovered that the elongation of a bone could be retarded by encircling the epiphyseal plate with a wire loop. This proved feasible in both laboratory animals and in children. Growth was held back mechanically. When the wire loop broke or was removed, growth was resumed at about the normal rate. The implications were tremendous. Haas had discovered the principle of temporary arrest of epiphyseal growth.[31]

We have used staples to control epiphyseal growth in children since 1944 with great satisfaction.[32] Complications have been few and easily remedied. Growth has been stopped almost completely with the use of three staples on either side of the epiphyseal plate. Angular deformity in a long extremity has been corrected by asymmetrical stapling.[33]

When Haas [34] stapled small animals, using ordinary carpenter's staples, his results were not consistent. He has since inserted crossed pins at the site of the epiphyseal plate and produced shortening.[35] Gelbke [36] has duplicated many of our findings by circling the epiphyses of puppies with wire loops.

Epiphyseal stapling is actually not new. Dr. Frank Walsh [37] recently called our attention to a case report by Arbuthnot Lane. In his first book published in 1905 [38] there is an illustration of a fracture through the distal femoral epiphysis of a boy of 15. An open reduction was performed, and the fragments were held in position by three staples on the medial side of the bone. In the first edition Lane reports a perfect result. For the second edition in 1914 [39] he investigated further and reported:

> I introduced several staples . . . on the understanding that I was to be permitted to remove them when union had taken place. When the boy got well the parents refused to allow of their removal. When I saw him a year later he had developed a bowing of the leg, due to cessation of growth in the inner segment of the growing line.
>
> The surgeon should not control a growing line by a plate or other means. If he is obliged to do so in order to retain the fragments in position, he should remove the control when union has taken place. As I pointed out, the rate of growth in the several portions of a growing line varied inversely as the pressure transmitted, and a neglect to remove the controlling apparatus results in a cessation of growth over the area of the growing line that is affected.

Unfortunately, Lane did not carry the thinking further and suggest the use of staples to arrest growth therapeutically.

Since the publication of a preliminary report two years ago,[33] we have continued to use the method without significant change, with a total of 117 operations on 90 patients, not including the removal of staples. The ages varied from 5 to 15 years with an average age of 10½ years. Four patients were under the preferred lower age limit of 8 years. One was 5 years, one 6 years, and two were 7 years of age. The result in one of these patients was entirely satisfactory. There were complications in three patients. In a boy of 7 years one staple gradually pulled out, and one cut through the epiphyseal plate. The staples were replaced without ill effect. In a boy of 6 years staples were placed in the tibia with difficulty. One staple pulled out and another broke. All staples were reinserted, and the result was good. In a girl, 5 years, one of the two medial staples was in the bone only at the proximal end, and the other pulled out, causing a

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26. Pease, C. N.: Local Stimulation of Growth of Long Bones, read at the American Academy of Orthopaedic Surgeons Meeting, Jan. 30, 1951.
27. von Langenbeck, B.: Ueber krankhaftes Längenwachsthum der Röhrenknochen und seine Verwerthung fur die chirurgische Praxis, Berl. klin. Wchnschr. **6**: 265, 1869.
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29. Bohlman, H. R.: Experiments with Foreign Materials in the Region of the Epiphyseal Cartilage Plate of Growing Bones to Increase Their Longitudinal Growth, J. Bone & Joint Surg. **11**: 365, 1929.
30. Wu, Y. K., and Miltner, L. J.: Procedure for Stimulation of Longitudinal Growth of Bone, J. Bone & Joint Surg. **19**: 909, 1937.
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33. Blount, W. P., and Clark, G. R.: Control of Bone Growth by Epiphyseal Stapling; Preliminary Report, J. Bone & Joint Surg. **31-A**: 464, 1949.
34. Haas, S. L.: Mechanical Retardation of Bone Growth, J. Bone & Joint Surg. **30-A**: 506, 1948.
35. Haas, S. L.: Restriction of Bone Growth by Pins Through Epiphyseal Cartilaginous Plate, J. Bone & Joint Surg. **32-A**: 338, 1950.
36. Gelbke, H.: Tierexperimentelle Untersuchungen zur Frage des epiphysären Längenwachstum des Knochens unter Druck, Longenbecks Archiv für Klinische Chirurgie **265**: 133, 1950.
37. Walsh, F.: Personal communication to the authors.
38. Lane, A.: The Operative Treatment of Fractures, London, The Medical Publishing Company, 1905, ed. 1, p. 95.
39. Lane, A.: The Operative Treatment of Fractures, London, The Medical Publishing Company, 1914, ed. 2, p. 133.

knock knee (Fig. 2). A year and one-half after insertion the medial staples were replaced and the lateral withdrawn (Fig. 3). When the knock knee was corrected, all of the staples were removed. Markers were implanted. Growth has continued at a normal rate (Fig. 4).

Fig. 1.—Right lower femur of J. D., 6 years 1 month (too young), on Sept. 27, 1946, 10 months after stapling for a short left femur. Three staples on each side would have been better. Note that on the lateral side the staples are bending equally. On the medial side one staple is bending excessively, the other not at all. Rule: A single staple is improperly placed if it does not bend while others do (see Fig. 2).

In our first paper it was established: 1. Efficient stapling of the distal femoral or proximal tibial epiphysis stops elongation of the bone at this epiphysis almost completely. 2. Angular deformity may be corrected during the growth period by asymmetrical placement of the staples. 3. After removal of the staples, growth at the epiphysis is resumed at about the same rate as would be expected on the other side, if it were normal.

Several important problems remained for future study: 1. What is the ideal material, size, and design for staples? 2. At what ages and for what length of time is it safe to leave staples in the bone with assurance of renewed growth on removal? 3. What facts can be established about the rate of growth after removal of staples? 4. What are the factors influencing epiphyseal closure? The facts which were established in the first paper have been verified by subsequent experience. The four open questions have been studied further, and some of them can be answered.

SPECIFICATIONS FOR STAPLES

Experience has proved that staples in two sizes made from 3/32 in. (0.2 cm.) stainless steel rods as originally described [33] are adequate for most situations. Three are used as a unit on either side of an epiphysis, sometimes in older children four. In early cases, when only two were placed on a side, they bent too much. A single staple on each side broke if growth was slow. During a growth spurt a single staple would pull out or cut through the epiphyseal plate and remain in the metaphysis without ill effect. Occasionally the fibular epiphysis should be stapled instead of curetted. To obtain a staple with shorter legs, one of the small size is driven part way, pulled out, and the ends cut off before the staple is redriven.

Staples have been made by a large number of instrument companies and persons. Some of the stainless steel has not been inert. Dr. Charles Frantz [40] reported to me 12 cases in which there was a local reaction about the staples with rarefaction of bone suggesting localized osteomyelitis. In two of these there were pain, swelling, and local heat. On removal of the staples the reaction subsided in all cases. Cultures were negative. There was found to be marked pitting and erosion of the staples due to electrolysis (Fig. 5).

Some of the stainless steel was softer than the specified Rockwell of 33 to 35 C. These staples have bent excessively with the force of growth, often enough to extrude. Slight bending is normal for any group of staples and may be desirable. It takes only 25 lb. (11.3 kg.) of pull to bend the points apart ⅛ in. (0.3 cm.) if it is localized ¼ in. (0.6 cm.) from the points of a staple. Failure of a staple to bend a little usually means that it is improperly placed (Fig. 2). Bending is less marked with steady growth than with spurts of rapid growth. After removal

Fig. 2.—Right lower femur of J. D. on May 3, 1947, eight months later than in Figure 1 and 18 months following stapling. From a growth line it was evident that the distal femoral epiphysis had grown 7 mm. on the medial side and only 1 mm. on the lateral, causing a knock knee. The lateral staples had held; one medial staple had pulled out. The second medial staple did not bend at all, so it was not securely in the bone. On removal it was found that the proximal end was in soft tissue.

40. Frantz, C.: Personal communication to the authors.

staples should not be bent back into shape and used again because bending increases the likelihood of breaking.

Various modifications of staples have been tried by us and by others who have used the method. We have settled on the ones described in the original article,[33] but with spear points instead of beveled ends. The way the staple is made is of less importance than the accuracy of placement. There is less chance of error when multiple staples are used.

Bends and notches for identification are superfluous. Roughening or barbing the staples has been tried by some to make them hold more securely. It is unnecessary if the child is of proper age. Unless the staples spread excessively, smooth ones will not extrude. Notching makes removal very difficult. The threat to the integrity of the growing epiphyseal plate is the removal, not the insertion, of the staples.

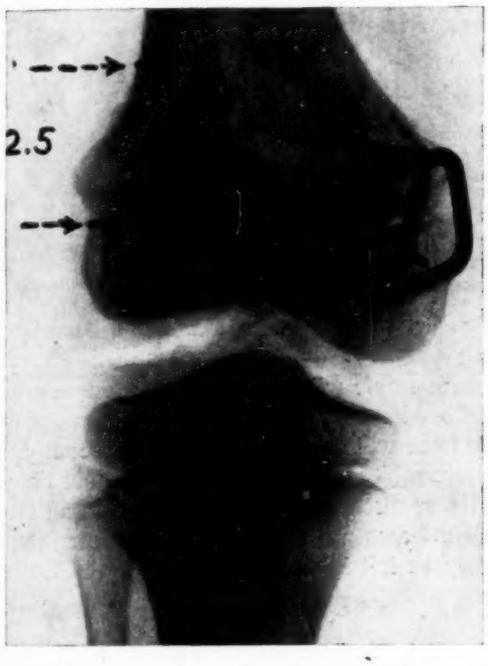

Fig. 3.—Right lower femur of J. D. on June 20, 1947, six weeks later than in Figure 2. X-ray was taken in the operating room on the day that the lateral staples were revised. The anterior of the medial staples was removed and replaced. Note the distortion of the femoral epiphyseal plate and the position of the markers. These figures show mistakes in the insertion of staples as well as correction of deformity arising from these errors. Eight months later, on Feb. 6, 1948, the knock knee was completely corrected, and the medial two staples were removed.

TECHNIC OF INSERTION

In general, the technic of insertion is the same as in the original article.[33] If both the tibia and femur are to be stapled, the two oblique incisions may be joined posteriorly to form a long posterior convex curve. In the original article, in discussing the lateral side of the distal femoral epiphysis, an error was made in the text. The word "dorsal" should be "anterior" in the third sentence of the paragraph—that is, the incision in the fascia is made in the thin expansion just anterior to the dense iliotibial band, and about ½ in. (1.3 cm.) anterior to the intermuscular septum. Staples should not be buried under the periosteum if they are to be removed later. It is unnecessary to cut into the epiphyseal plate to identify it. Frequently in older children it can be seen shining through the periosteum. The cartilage may be identified by probing with a needle. In younger children a homogenous cartilage cap covers the entire bone end. Staples are inserted "blind" by palpating the cartilagenous landmarks and comparing with the x-ray appearance. Soft parts must be divided down to the periosteum. If movable fascial layers are impaled by the staples, there will be postoperative pain, swelling, and limitation of motion. The staples should always be pointed toward the center of the bone. The commonest mistake of insertion is to

Fig. 4.—Femur of J. D. on April 30, 1951, three years and two months after removal of the staples and three years and ten months later than in Figure 3. Note that the alignment and contours were normal. The distal femoral epiphysis was normally open in both views. The proximal marker on the medial side had been extruded from the bone due to retubulation. (Markers are now inserted near the middle of the shaft.) The lateral markers were still accurately placed. Since June 20, 1947, there had been an increment at the distal end of the femur of 5.5 cm. This is well within the normal limits of Baldwin's tables, as arranged by Hatcher.[18]

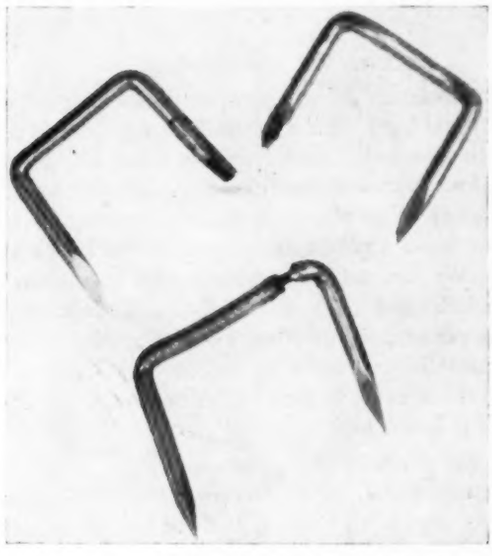

Fig. 5.—Staples made of bad stainless steel which had to be removed because of the local reaction. Note the pitting and erosion of the metal due to electrolysis.

allow one point of the posterior staple to protrude into the popliteal space. The obliquity of either the femoral or tibial condyle makes it likely that one point of the staple will enter the bone satisfactorily and the other not engage the cortex at all (Fig. 2 and 3). These mistakes should be checked by accurate x-rays in two planes. It is

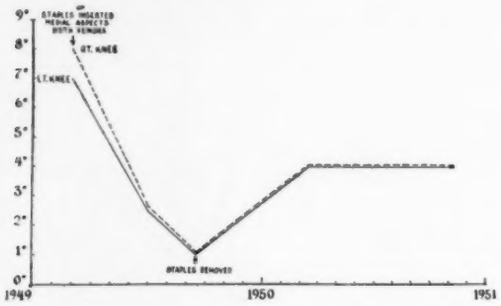

Fig. 6.—A graph of correction of the idiopathic genu valgum of M. B., aged 9, after insertion and removal of staples. The deformity was corrected from 7 to 8 degrees down to 1 degree in six months. After removal of the staples there was some recurrence of the deformity. The stimulus of removal caused a growth spurt of the medial sides of the femoral epiphyses. The growth rate returned to normal within six months, and the alignment of the legs remained constant. Most angular deformities should be overcorrected before the staples are removed.

important to center the staples properly from front to back. Slight anterior displacement of the staples is a potent force in causing back knee, just as posterior displacement will correct this deformity.

Eight years is still the proper lower age limit for the average case. Occasionally in the well-developed child stapling may be done earlier. It is technically difficult to drive staples into the thick cartilaginous ends of the bones of very young children. The staples spring out again. They are likely to bend and extrude with growth.

REMOVAL OF STAPLES

We first removed the staples when the angular or linear deformity had been just corrected. This was done in some cases with complete satisfaction. But in rapidly growing children knock knee deformities must be overcorrected. The removal of staples is sufficient stimulus to bone growth to cause a partial recurrence of the knock knee (Fig. 6). We now advise overcorrection of angular deformities before removal of the staples. Deformity produced by post-traumatic closure of an epiphysis at one margin must be corrected by osteotomy. Stapling will only prevent increase in the angulation. Staple the opposite leg if it is too long.

There are several factors influencing the time of removal of staples after the correction of linear deformities. When epiphyses have been stapled for two years or less (cases with longer intervals are being observed), the operation to take out the staples causes a growth spurt which overcomes some of the previous correction. But overcorrection should not be done, because a stapled epiphysis will mature more rapidly and will close a few months before the one on the opposite side (if the opposite side is normal). A little lost correction may be made up at the end of the race. If the stimulating factor is still present (osteomyelitis), linear deformities must be well overcorrected.

RATE OF GROWTH

The rate of growth after removal of staples is still uncharted. There are so many variables that every case is individual. There is rarely an occasion to staple one of two symmetrical legs In general, it may be said that after removal of staples there is a growth spurt. An epiphyseal plate, which has become paper-thin, will rapidly expand until it is as thick or thicker than the one on the opposite side. This phenomenon has been observed also in experiments with puppies.[36] After a few months of acceleration growth continues at the normal rate.

NEW DEVELOPMENTS

Further experience has shown the wisdom of correcting complex deformities by asymmetrical stapling at one stage. Let us take the example of a boy with infantile paralysis, two weak legs, and a back knee, knock knee deformity on the long side. The old method of correction of the deformity was to place three staples posteriorly and medially in the femoral condyle. When the leg was straight with reference to the valgus position, more staples were placed posteriorly on the lateral side. The back knee was slower to correct than the knock knee but usually disappeared when the legs were of equal length.

It is simpler to place four staples medially and posteriorly on the femoral condyle and one laterally and posteriorly (Fig. 7).

The single staple will bend and allow some growth, while the four hold securely, so that the valgus position and back knee will straighten out simultaneously. The angular deformities will be corrected at about the time that the linear discrepancy is equalized, and all staples may be withdrawn at once. If growth is complete, the staples may be left in situ.

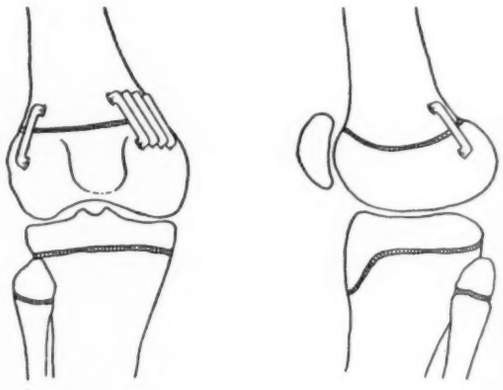

Fig. 7.—Sketch of the placement of staples to correct a knock knee, back knee deformity in a long leg. All deformities are corrected simultaneously by posterior placement of three or four staples in the medial femoral condyle and one in the lateral. When the result is obtained, all staples are removed if further growth is anticipated.

Recent experiments by Drs. Strabino and Colonna [41] have proved that a force in excess of 120 lb. (54.4 kg.) is required to stop the growth of an upper tibial epiphysis in a calf. This is no surprise. The growth force against the staples is tremendous. Single staples have repeatedly

41. Strabino, L. W., and Colonna, P. C.: Personal communication to the authors.

broken. Two staples on either side of the bone have bent excessively. Even three staples as a unit will bend if the growth spurt is rapid.

We were led to experiment with the forces involved. A hydraulic distractor was adapted to hold small blocks of bone or other material. If one staple is driven in calf bone or in 12-year-old human bone, a distraction force of only 80 lb. (36.3 kg.) will cause the staple to cut out. If one block is epiphysis while one is metaphysis, the staple will cut through the cancellous epiphysis and pull out of it. Maximum bending will take place at the metaphyseal angle.

Although staples cut out so easily, single staples have repeatedly broken in growing children. Accurate tests show that it takes 900 lb. (388.6 kg.) of pull to break a single staple. It is possible to develop this force in growing bone because of a biologic factor. Dense bone is deposited around the staples. This stops them from cutting. It prevents the legs from diverging. This adaptation of the growing bone ends explains the discrepancy between the available initial resistance of 80 lb. and the ultimate force of 900 lb. which must be developed to break the staple. Between these extremes, the staples have much more than the restraining force necessary to prevent longitudinal growth according to Strabino and Colonna.

In an article last year Eyre-Brook [42] has considered surgery only in discrepancies of leg length which exceed 1½ in. (3.8 cm.). Before accepting this figure, one must consider many factors. In growing children increasing discrepancy is frequently predictable. Then a difference of ½ in. (1.3 cm.), or even less, justifies stapling as a prophylactic measure. On the other hand, in a tall young adult, who is well adjusted to a short leg, a difference of 1½ in. may not be an indication for a femur shortening. After greater experience with the stapling procedure we have come to equalize lesser linear and angular deformities which are unsightly but only moderately disabling.

SUMMARY

As we learn more about the factors influencing bone growth in the human, combinations of bone stimulation and retardation will be used more and more to equalize linear and angular deformities. Stapling will be of practical importance until a better method of growth retardation is found. Epiphysiodesis is still a useful operation when growth arrest promises only incomplete correction. Bone shortening operations can never be abandoned. Lengthening is occasionally indicated. Growth stimulation is again on trial.

After the insertion or removal of staples the factors that influence growth are so complex that each case is individual. It is safe to say: 1. Staples may be left in place at least two years and then removed, with the expectation that growth will be resumed. 2. After removal of the staples there is a local growth spurt. This usually lasts only a few months. Then growth continues at the normal rate. 3. Epiphyseal closure is usually several months premature in a stapled bone. The factors which caused the previous discrepancy of length are often more important than the stapling in determining the relative time of closure. Further observation over a longer period of time is necessary before the last three items can be discussed further.

324 E. Wisconsin Ave. (Dr. Blount).

42. Eyre-Brook, A. L.: Bone-Shortening for Inequality of Leg Lengths, Brit. M. J. **4700**: 222, 1951.

CYTOLOGICAL METHODS FOR EARLY DETECTION OF UTERINE CANCER

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The introduction of cytological methods for the early diagnosis of uterine cancer has been a significant modern development in spite of waning emphasis on the morphological approach to clinical problems. The emergence of the method was the logical outcome of two separate series of investigations—the introduction of the concept of noninvasive carcinoma by Rubin [1] and the perfection by Papanicolaou [2] of technical methods for studying cells exfoliated from the female genital tract. The principle on which the method rests derives from phenomena implicit in the observations of Coman,[3] namely, that the force required mutually to separate normal cervical cells is some 10 times that required to separate the cells of squamous carcinoma of the cervix. The usefulness of exfoliative cytologic studies in the early diagnosis of uterine cancer has been extensively studied during the past eight years. Several investigators [4] have convincingly documented its relative reliability, and L'Esperance [5] effectively demonstrated that it has value as a screening technique in cancer prevention clinics.

The paramount contribution of the method to modern gynecology is its demonstrated reliability as a technique whereby clinically unsuspected cervical cancer may be discovered in its incipiency. Papanicolaou [2e] established solid criteria for the identification of malignant cells in suitably stained smears obtained from vaginal mucous surfaces, and Ayre [6] devised a highly satisfactory wooden spatula for scraping cells from the squamocolumnar junction of the cervix. Skapier [7] and Graham and Meigs [8] used the method as a large scale screening test, with gratifying results within its acknowledged limitations. The present paper adds to the published findings of these

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and other investigators the data derived from three years' intensive experience in the gynecologic clinic of Parkland Hospital.

STUDIES AND RESULTS

This study was carried out between Aug. 1, 1947, and Sept. 1, 1950, and was subsidized by a grant from the Texas Division of the American Cancer Society. During the entire period indicated, all patients coming to the gynecologic outpatient clinic of Parkland Hospital were routinely subjected to cytological screening of the cervix. Later, routine smears were taken on obstetric outpatients, and, for approximately one year, virtually the entire female personnel of the hospital, including volunteer hospital employees, were similarly screened.

Method.—Two smears were obtained on each patient: (1) Fluid aspirated from the cervical canal with a suction pipette was smeared thinly on a glass slide; (2) the squamocolumnar junction was denuded circumferentially with an Ayre spatula, and the material spread as evenly as possible on a slide. Smears made in this way were fixed immediately in equal parts of 95% alcohol and ether for at least one hour; they were then stained by the method of Papanicolaou,[4b] mounted, and screened for anaplastic cells.

Results.—In this study the smears from 6,816 women were examined (Table 1). One hundred twelve, or 1.64%, of these preparations proved to be from patients harboring cervical carcinomas. Seventy-six women, or 1.11%, had carcinomas which would have been discoverable by purely clinical means. The remaining 36 patients, or 0.53%, would have passed without suspicion of cancer through the office of the most competent gynecologist.

Biopsy confirmation of the 36 clinically unsuspected carcinomas brought to light 13 histologically invasive lesions; while the remaining 23 tissue preparations fulfilled the morphological criteria of so-called "noninvasive" carcinoma (Table 2). The diagnosis of noninvasive carcinoma was made in each case only after careful study of multiple serial sections failed to demonstrate breakthrough of the basement membrane with stromal invasion. Extension of the neoplastic epithelium into glands was not regarded as evidence of invasion, an interpretation contrary to the opinion of TeLinde [9] and in accordance with that of Younge, Hertig, and Armstrong.[10]

TABLE 1.—*Cytological Detection of Carcinoma of Cervix Uteri*

	No.	% of Total
Total patients surveyed *	6,816	100
Total patients with cervical carcinoma	112	1.64
Patients with clinical carcinoma	76	1.11
Patients with unsuspected carcinoma, detected by cytological methods	36	0.53 (1:189)

* From Aug. 1, 1947, to Sept. 1, 1950.

TABLE 2.—*Biopsy Diagnosis: Thirty-Six Patients with Unsuspected Cervical Carcinoma*

	No. of Patients
Noninvasive carcinoma	23
Invasive carcinoma	13

TABLE 3.—*Cytological Detection of Carcinoma of Corporal Endometrium*

Total patients surveyed *	6,816
Patients with proved carcinoma of endometrium	7 (0.1%)
Patients with positive cytological smear	4
Patients with false negative smears	3
Patients with false positive smears	0

* From Aug. 1, 1947, to Sept. 1, 1950.

TABLE 4.—*Average Ages of Patients with Unsuspected Cervical Carcinoma*

	Yr.
Patients with noninvasive cervical carcinoma	34.6
Patients with invasive cervical carcinoma	40.8
All patients with unsuspected cervical carcinoma	36.6
Youngest patient with noninvasive carcinoma	19
Youngest patient with invasive carcinoma	21

In our hands cytological studies proved to be considerably less successful in the early diagnosis of carcinoma of the corporal endometrium than in the detection of cervical cancer. Seven patients with carcinoma of the endometrium proved by curettage were encountered in the present series (0.1%). Four of these women had positive cytological smears; three did not (Table 3).

It is significant that the average age of the patients with unsuspected cervical carcinoma detected by cytological study was 36.6 years (Table 4) in contrast to the overall average of 48 years among women with clinical gross cervical cancer. Of these patients, those with histologically invasive lesions had an average age of 40.8 years, while those with noninvasive carcinomas had an average age of only 34.6 years. This observation is in close conformity with the findings of TeLinde and Galvin,[11] who

1. Rubin, I. C.: The Pathological Diagnosis of Incipient Carcinoma of the Uterus, Am. J. Obst. **62**: 668-676 (Oct.) 1910.

2. (*a*) Stockard, C. R., and Papanicolaou, G. N.: The Existence of a Typical Œstrous Cycle in the Guinea Pig: With a Study of Its Histological and Psychological Changes, Am. J. Anat. **22**: 225-283 (Sept.) 1917. (*b*) Papanicolaou, G. N.: New Cancer Diagnosis, Proceedings of the Third Race Betterment Conference, 1928, p. 528. (*c*) Papanicolaou, G. N.: The Sexual Cycle in the Human Female as Revealed by Vaginal Smears, Am. J. Anat. **52**: 519-637 (May) 1933. (*d*) Papanicolaou, G. N., and Traut, H. F.: The Diagnostic Value of Vaginal Smears in Carcinoma of the Uterus, Am. J. Obst. & Gynec. **42**: 193-206 (Aug.) 1941. (*e*) Papanicolaou, G. N., and Traut, H. F.: Diagnosis of Uterine Cancer by the Vaginal Smear, London, The Commonwealth Fund, 1943.

3. Coman, D. R.: Decreased Mutual Adhesiveness, a Property of Cells from Squamous Cell Carcinomas, Cancer Res. **4**: 625-629 (Oct.) 1944.

4. (*a*) Meigs, J. V.; Graham, R. M.; Fremont-Smith, M.; Kapnick, I., and Rawson, R. W.: The Value of the Vaginal Smear in the Diagnosis of Uterine Cancer, I Surg., Gynec. & Obst. **77**: 449-461 (Nov.) 1943. (*b*) Meigs, J. V., and others: The Value of the Vaginal Smear in the Diagnosis of Uterine Cancer: A Report of 1,015 Cases, ibid. **81**: 337-345 (Oct.) 1945. (*c*) Ayre, J. E.: A Simple Office Test for Uterine Cancer Diagnosis, Canad. M. A. J. **51**: 17-22 (July) 1944. (*d*) Ayre, J. E.; Bauld, W. A. G., and Kearns, P. J.: A Test Case to Show the Value of a Cervical Cytology Smear in Uterine Cancer Diagnosis, Am. J. Obst. & Gynec. **50**: 102-105 (July) 1945. (*e*) Ayre, J. E.: Vaginal and Cervical Cytology in Uterine Cancer Diagnosis, ibid. **51**: 743-750 (June) 1946. (*f*) Jones, C. A.; Neustaedter, T., and Mackenzie, L. L.: The Value of Vaginal Smears in the Diagnosis of Early Malignancy: A Preliminary Report, ibid. **49**: 159-168 (Feb.) 1945. (*g*) Fremont-Smith, M.; Graham, R. M., and Meigs, J. V.: Vaginal Smears as an Aid in the Diagnosis of Early Carcinoma of the Cervix, New England J. Med. **237**: 302-304 (Aug. 28) 1947. (*h*) Fremont-Smith, M.; Graham, R. M., and Meigs, J. V.: The Cytologic Method in the Diagnosis of Cancer, ibid. **238**: 179-181 (Feb. 5) 1948.

5. L'Esperance, E. S.: The Early Diagnosis of Cancer, Bull. New York Acad. Med. **23**: 394-409 (July) 1947.

6. Ayre, J. E.: The Selective Cytology Smear for Diagnosis of Cancer, Am. J. Obst. & Gynec. **53**: 609-617 (April) 1947.

7. Skapier, J.: Evaluation of the Cytologic Test in the Early Diagnosis of Cancer: A 2-Year Survey of the Routine Use of the Smear Technique, Am. J. Obst. & Gynec. **58**: 366-375 (Aug.) 1949.

8. Graham, R. M., and Meigs, J. V.: The Value of the Vaginal Smear, Am. J. Obst. & Gynec. **58**: 843-850 (Nov.) 1949.

9. TeLinde, R. W.: in Meigs, J. V., and Sturgis, S. H., Editors: Progress in Gynecology, New York, Grune & Stratton, Inc., 1946.

10. Younge, P. A.; Hertig, A. T., and Armstrong, D.: A Study of 135 Cases of Carcinoma in Situ of the Cervix at the Free Hospital for Women, Am. J. Obst. & Gynec. **58**: 867-895 (Nov.) 1949.

found an average age of 37.1 years for women with carcinoma in situ.

The commonest error to which the cytological method is subject is, in our experience, the false positive interpretation of a smear (Table 5). There were 18 smears reported as positive which did not prove to originate from carcinomatous lesions when biopsy studies were made. This represents an incidence of false positive error of 0.26%, which compares closely with the incidence of this type of error in the various series of Graham and Meigs.[8] Of interest was the observation that a characteristically positive smear was obtained from a patient later proved to have tuberculous cervicitis, an error which might reasonably be anticipated from consideration of the morphological features of tuberculosis, with its bizarre epithelioid and giant cell reactions. It is obvious that figures purporting to indicate incidence of false negative smears carry little significance, since many such errors will go undetected. Others [12] have estimated that the incidence of false negative reports approaches 10 to 30%.

The diagnosis of the lesions of the 36 patients with unsuspected carcinoma discovered by cytological smear was confirmed in each case by cervical biopsy. A modified Sturmdorf tracheloplasty technique was found to produce the most satisfactory tissue specimen for study, since the cone of tissue excised in this manner contains the entire squamocolumnar junction in its pristine state.

Methods of Treatment.—Table 6 summarizes the methods which were used in the treatment of the 36 patients with unsuspected carcinoma of the cervix discovered by cytological methods. By and large, the early invasive carcinomas were managed as carcinoma of the cervix in general. Seven Wertheim operations were performed; five patients were treated with standard radium and x-ray methods, while one patient with a concomitant tuberculous endometritis was treated with radium alone.

Of the 23 women with noninvasive carcinoma, 15 were treated by simple total hysterectomy, 5 by hysterectomy with gland dissection, and 1 each by hysterectomy followed by irradiation, removal of cervical stump, and the biopsy procedure of Sturmdorf tracheloplasty alone (the last patient refused further treatment).

DISCUSSION AND COMMENT

With the development of improved methods of treatment of the early stages of carcinoma of the cervix, there has arisen a fruitful field of opportunity for methods aiming at the early detection of these lesions. Numerous investigators have now established the reliability of the vaginal smear for this purpose, provided always that the limitations are understood and at all times kept clearly in mind. First, it must be impressed on everyone using the method that under no circumstances should any definitive therapeutic program be undertaken on the basis of a positive cytological smear alone; every positive smear must be checked by adequate tissue biopsy and treatment based on the histological report. Second, the interpretation of the smears must be undertaken only by persons adequately trained; untold harm may result if inadequately trained persons are entrusted with the screening of these smears. Third, it would appear that, for the present at least, interpretation of smears should be done in certain centers where adequately trained personnel are available. There are still enough limitations in the method to discourage its general adoption among practicing gynecologists, although when existing facilities for reading are expanded collection of smears may well become a standard item in the gynecologist's armamentarium. Such a trend would tend to be markedly accentuated by long term follow-up of patients with so-called noninvasive carcinoma. Fourth, there are certain economic considerations which may delay the widespread use of the method. In this study the average cost in materials and technician personnel alone amounted to $2.22 per patient studied, and the average cost of discovering each case of clinically unsuspected carcinoma of the cervix was approximately $357.45. This estimate is, of course, exclusive of any fee for the professional service of reading the slide. It is questionable whether so expensive a screening method should be routinely used in a gynecologic private practice. On the other hand, the cost does not prohibit use in selected patients.

TABLE 5.—*Diagnostic Errors in Vaginal Cytological Method*

	No.
Total patients surveyed	6,816
False positive	18 (0.26%)
Carcinoma of cervix	
False positive *	17
Carcinoma of corporal endometrium	4
False positive	1
False negative	3

* A false positive cervical smear proved to be from a tuberculous cervicitis.

TABLE 6.—*Treatment of Thirty-Six Patients with Unsuspected Carcinoma of Cervix*

Invasive carcinoma	
Radical hysterectomy (Wertheim)	7
Radium and x-ray	5
Radium alone	1
Noninvasive carcinoma	
Simple total hysterectomy	15
Hysterectomy with gland dissection	5
Hysterectomy and x-ray	1
Removal of cervical stump	1
Sturmdorf amputation alone *	1

* Patient refused further treatment.

SUMMARY AND CONCLUSIONS

Under a grant from the Texas Division of the American Cancer Society, 6,816 patients were subjected to vaginal cytological screening over the period from Aug. 1, 1947, to Sept. 1, 1950. One hundred twelve, or 1.64%, of these patients had cervical carcinoma; 76, or 1.11%, were clinically detectable; 36, or 0.53%, were clinically unsuspected. All positive cytological smears on preclinical lesions were confirmed by adequate biopsy. The average age of patients with unsuspected cervical carcinoma was 36.6 years. Of seven proved cases of carcinoma of the endometrium, in only four were there positive cytological smears. There were 18 false positive smears, or 0.26%. The obvious advantages of this method in screening early lesions of the cervix are partially offset by difficulties of interpretation and economic drawbacks.

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11. TeLinde, R. W., and Galvin, G.: The Minimal Histological Changes in Biopsies to Justify a Diagnosis of Cervical Cancer, Am. J. Obst. & Gynec. 48: 774-797 (Dec.) 1944.
12. Scheffey, L. C.: in Graham and Meigs.[8]

CLINICAL NOTES

REPAIR OF SURGICAL ABDOMINAL WALL DEFECT WITH TANTALUM MESH

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Early in 1948 I operated on a woman with a large defect in the left upper abdominal quadrant resulting from a gunshot wound.[1] After many intestinal adhesions were released from the hernial sac, scarcely enough peritoneum remained for closure. The muscular and fascial defect was closed with tantalum mesh. This case made me wonder what would happen if I did have a case in which the peritoneum could not be closed and I wanted to use tantalum mesh. Therefore we [2] created large defects in the abdominal wall of dogs by removing the rectus muscle, fascia, and peritoneum. These defects were repaired with tantalum mesh. The greater omentum and spleen had also been removed, so that there would be no buffer between the intestines and the mesh. Perfect healing took place in these animals, and there were only mild adhesions between the loops of intestine and the mesh; the adhesions were in no way obstructive and did not interfere with the health of the animals. Soon after these experiments were completed, I had a case in which the results demonstrated could be applied clinically.

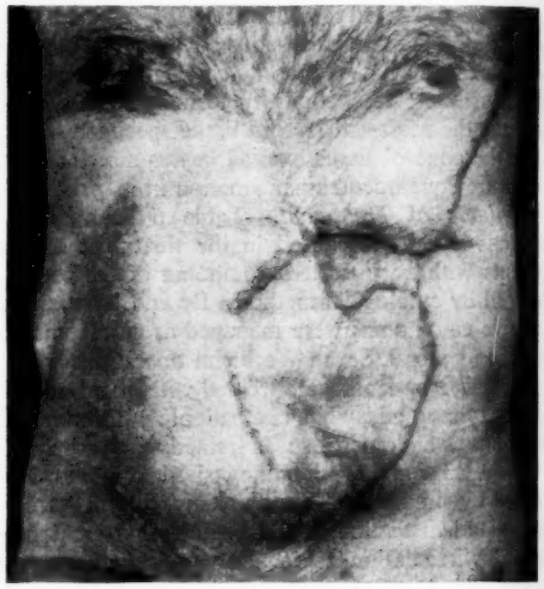
REPORT OF A CASE

History.—R. B. L., a white farmer aged 59, was first seen on Nov. 4, 1949. He had a birthmark on his abdomen. The mark was about the size of the end of his thumb until four years before he came to see me, when it began to grow. He had recently had six x-ray treatments and 12 years previously had had other x-ray treatments. The patient had also had a hernia on the right side for six or seven years and had worn a truss about six years, but the truss did not retain the hernia very well.

Physical Examination.—A large bluish-black birthmark 6 in. (15.2 cm.) in diameter in one direction and 5 in. (12.7 cm.) in another was situated just to the left of and below the umbilicus, involving the umbilicus. In the center of the area was one minute ulcerated spot, but otherwise the lesion seemed benign. It was flat and level with the skin. No lymph nodes were palpable in either inguinal region, but nodes were palpable in both axillas. One node in the left axilla was slightly larger and firmer than the rest. On the right side a scrotal hernia about the size of an orange was not retained by the truss. The hernia was almost completely reducible when the patient reclined, but not entirely.

Operative data.—Operation was performed at the Church Home and Hospital on Nov. 25, 1949, with the patient under thiopental (pentothal®) sodium, nitrous oxide, and curare anesthesia. The large melanoma was excised with a 1 in. (2.5 cm.) margin all the way around, along with subcutaneous tissue and abdominal fascia. In removing the umbilicus with the rest of the lesion, a large margin of peritoneum was excised. The specimen was sent to the laboratory, where it was examined immediately by the pathologist, Dr. Vernon Norwood, who reported that it was a melanotic sarcoma. The abdomen was opened wider and the liver palpated and inspected. No metastases could be found, nor could the round ligament of the liver be located. The wide gap in the peritoneum, occasioned by the removal of part of it with the umbilicus, could not be closed. The rectus muscle was then dissected free from the underlying posterior sheath in a wide area surrounding the gap, and a piece of tantalum mesh 4 by 8 in. (10.2 by 20.3 cm.) was placed between the rectus muscle and the posterior sheath. The gap was effectively closed where the peritoneum had been resected, but the intestines were in immediate contact with the mesh, because the patient had a short omentum that could not be brought down between the intestines and the mesh. The mesh was placed with only one suture, at the upper end. There was no buckling, and the mesh lay flat between the posterior sheath of the rectus and the rectus muscle, covering well the peritoneal gap. Since the anterior rectus sheath had been resected with the melanoma, it could not be used to close the abdominal wall. The rectus muscles were closed with interrupted sutures as well as possible, but they could not be closed in the region of the umbilicus, leaving a gap in the abdominal wall protected only by the underlying tantatum mesh.

From the upper outer margin of the round excised area up to the axilla a piece of skin, subcutaneous tissue, and fascia approximately 2 in. (5.0 cm.) wide was excised. Then the axillary nodes and all the axillary tissue were removed en bloc by radical axillary dissection with the strip of skin, subcutaneous tissue, and fascia. This mass of tissue was immediately examined by the pathologist, who reported that the glands appeared to be cellular but contained no melanin. Skin flaps were then dissected free in all directions, and the wound was closed as far as possible without too much tension. A defect in the abdominal wound 4 by 6 in. (10.0 by 15.2 cm.) could not be closed, in spite of the wide dissection of flaps. This defect was closed by split thickness grafts cut from the left thigh (see figure).



Photograph taken four and one-half months after operation while the patient was in the hospital for surgical repair of an inguinal hernia.

Convalescence was uneventful. The patient was discharged from the hospital on Dec. 23, 1949. He returned for repair of the right inguinal hernia on March 23, 1950. He was last examined on Nov. 15, 1951, at which time the abdominal wall and the site of the inguinal hernia repair were firm. There was no evidence of recurrence of the melanotic sarcoma. The final diagnosis was melanotic sarcoma of the abdominal wall and indirect inguinal scrotal hernia on the right side.

OTHER REPORTED CASES

Bussabarger, Dumouchel and Ivy [3] have reported a case in which massive resection of the abdominal wall was performed for adenocarcinoma of the cecum involving the anterior abdominal paries extensively. After the

1. (*a*) Koontz, A. R.: Tantalum Mesh in Hernia Repair: Experimental and Clinical Results, Tr. South. S. A. **60**: 394-403, 1948; (*b*) Tantalum Mesh in Repair of Ventral and Inguinal Hernias, South. Surgeon **16**: 1143-1148 (Dec.) 1950.

2. Footnote 1*a*. Koontz, A. R., and Kimberly, R. C.: Tissue Reactions to Tantalum Mesh and Wire, Ann. Surg. **131**: 666-686 (May) 1950.

3. Bussabarger, R. A.; Dumouchel, M. L., and Ivy, W. H.: Use of Tantalum Mesh to Repair Large Surgical Defect in Anterior Abdominal Wall, J. A. M. A. **142**: 984-985 (April 1) 1950.

defect was closed as far as possible by approximating its edges, the remaining defect, measuring 3.5 by 5 in. (9.9 by 12.7 cm.), was closed by suturing a piece of tantalum gauze to the fascial edges. They had, however, been able to close the peritoneum first. The skin could not be completely closed. The peritoneal closure must have broken down subsequently, because during the convalescent period intestines floating in ascitic fluid could be seen through the screen. The wound eventually closed by granulation.

Stafford [4] reports a case of defect in the abdominal wall following retropubic prostatectomy. The bladder wall bulged through the defect and was distressing to the patient whenever the bladder was full. The defect was closed with a piece of tantalum mesh placed next to the bladder wall. There have been no untoward effects.

SUMMARY

A case is reported in which, after resection of a melanotic sarcoma of the abdominal wall involving the umbilicus, the peritoneum could not be closed. The abdominal fascia had been resected, and the muscles could not be completely closed in the midline. Tantalum mesh was used to close the defect. The presence of intestine next to the tantalum has caused no difficulty.

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4. Stafford, E. S.: Personal communication to the author.

ANAPHYLACTIC SHOCK FOLLOWING INTRAVENOUS ADMINISTRATION OF VITAMIN B COMPLEX

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Vitamin preparations for parenteral administration have been employed extensively by all branches of medicine. In view of their wide parenteral use the ratio of serious reactions to the number of injections given must be exceedingly small; however, severe anaphylactic reactions do occur from parenteral administration of vitamins and for this reason the following case is reported as a reminder.

Circulatory collapse from intravenous [1] and intramuscular [2] injections of thiamine hydrochloride has been reported. Anaphylaxis due to intravenous administration of nicotinic acid [3] and folic acid [4] has also been reported, but to our knowledge no instance of circulatory collapse following intravenous administration of vitamin B complex has been recorded.

REPORT OF A CASE

F. H., a 52-year-old white insurance agent, had received parenteral injections of vitamin B complex intermittently from several physicians for about a year because of nervousness, fatigue, and malaise. He was seen by one of us (C. D. M.) in the office on Nov. 22, 1948, and at his request was given 1 cc. of vitamin B complex intravenously. The product used was one containing in each cubic centimeter thiamine hydrochloride, 100 mg.; riboflavin, 1 mg.; pyridoxine, 5 mg.; nicotinamide, 100 mg., panthenol® (d-pantothenyl alcohol) equivalent to 1 mg. of calcium pantothenate; benzyl alcohol, 20 mg.; and sufficient isotonic sodium chloride solution to make 1 cc. The injection was made under routine aseptic conditions. Almost immediately the patient cried, "I am dying," became cyanotic, and fell to the floor. Respiration ceased, and there were generalized tetanic muscular contractions. The radial pulse and blood pressure could not be obtained. Approximately 0.5 cc. of 1:1,000 epinephrine solution was given intravenously, and artificial respiration with oxygen was instituted. After three to five minutes respiratory movements returned, and the cyanosis gradually cleared, in about one-half hour. The pulse, although weak, was palpable about this time. Blood pressure determination was not repeated. Moist rales could be heard at the bases of the lungs.

The patient was admitted to the hospital and became conscious about one hour after the injection of vitamin B complex. On regaining consciousness he complained of a severe generalized headache. The headache was accompanied by nausea and vomiting. Morphine sulfate, ¼ grain (15 mg.), was administered, and later meperidine (demerol®) hydrochloride, 50 mg. every four hours, controlled the pain. The next morning the patient felt fairly well but was restless and slightly nauseated. He improved rapidly and was discharged on the third hospital day.

Results of laboratory examinations, including routine urinalysis, determination of hemoglobin level, and red blood cell count were normal the day after admission. The white blood cell count was 12,600. An electrocardiogram made about one and a half hours after the injection revealed isoelectric T waves in leads 1 and V2. The T waves were low in leads 2, 3, and V5. The T wave was inverted slightly in V4. A deep Q3 wave was present, and the QRS interval was 0.10 second in the limb leads. Another tracing two days later showed that the T waves had become upright in leads 1, 2, V2, and V4, and inverted in lead 3. The Q3 wave had disappeared.

On close questioning after the patient felt well enough to discuss the episode, it was learned that several months prior to this injection he had noticed dizziness and weakness after an intramuscular injection of vitamin B complex. After that, however, he had received several intramuscular and intravenous injections with no ill-effect.

This case illustrates several points. First, vitamin preparations should be given orally when that route is feasible. Second, in the few selected cases in which intravenous administration of vitamins is necessary, it should be done slowly, and probably the preparation should be diluted to avoid speed reactions. Third, any patient who is to receive vitamins parenterally should be questioned closely about any symptoms following previous injections. In this way a sensitivity may be found and thus a severe reaction may be prevented. Pelner [3a] has suggested that a skin sensitivity test be made prior to parenteral administration of nicotinic acid. Weigand [5] has advised this also in his report of 179 cases of sensitivity to thiamine hydrochloride. Fourth, epinephrine should be at hand, preferably in a syringe, when parenteral administration of vitamins is contemplated. Finally, the circulatory collapse that occurred here caused definite coronary insufficiency, as evidenced by electrocardiographic changes. This possibility should be kept in mind, especially in older patients with arteriosclerosis, as myocardial infarction could easily ensue.

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SUMMARY

A case of circulatory collapse following the intravenous administration of vitamin B complex is reported. Several facts illustrated by this case are listed.

FACTOR 5 DEFICIENCY IN HEMORRHAGIC DIATHESIS (PARAHEMOPHILIA)

Stuart W. Cosgriff, M.D.
and
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Normal plasma has been reported to contain a globulin which is a highly active accelerator of blood clotting. This factor acts by catalyzing the interaction of prothrombin, thromboplastin, and calcium in the formation of thrombin. In the absence of this factor blood clotting is delayed markedly. Owren [1] in 1944 discovered this new factor, which he called the fifth coagulation factor, or Factor 5. Fantl and Nance [2] and Ware, Guest, and Seegers [3] also demonstrated this new factor and its mechanism of action, calling it "accelerator globulin" or Ac-globulin. Quick's labile factor [4] may be very similar to or identical with Factor 5. In vivo deficiency of this factor was reported by Owren [1] as the mechanism of a hemorrhagic diathesis in a 29-year-old woman. This deficiency of Factor 5, considered to be congenital, characteristically was associated with a prolonged clotting time of venous blood and a prolonged one-stage prothrombin time. Owren termed this disease "parahemophilia."

An instance of severe postoperative hemorrhagic diathesis has recently been observed in a 66-year-old man with a profound decrease of Factor 5 (Ac-globulin) in his blood.

REPORT OF A CASE

L. D'A., a 66-year-old man, was admitted to the urological service of Presbyterian Hospital on Sept. 21, 1950, for a bilateral orchiectomy as treatment for carcinoma of the prostate gland with extensive bone metastases.

In 1945, at the age of 60, he had experienced a myocardial infarction, from which he made an uneventful recovery. There was no history of previous bleeding tendency in the patient or in his family. Operative procedures for removal of a ruptured appendix, total thyroidectomy, and treatment of sinusitis had been performed during the preceding 20 years without hemorrhagic complications.

Three years prior to admission the patient first noted a mass, which was firm and fixed, in the left supraclavicular fossa. In December, 1947, because of its rapid growth, he was admitted to another hospital. Biopsy of the mass was performed and on histological examination it was thought to be a metastatic carcinoma, probably originating from the thyroid gland. Examination of the thyroid disclosed no unusual conditions and a skeletal survey revealed no metastases. A two-stage total thyroidectomy with left radical neck dissection was performed, but a serial section of the thyroid did not reveal a carcinoma. After this operation he was maintained in a relatively euthyroid state on 30 mg. of thyroid extract per day; he had no further evidence of local recurrence of carcinoma in the neck.

At that time (1947) rectal examination revealed a nodule in the upper left pole of the prostate gland which was suspected to be carcinoma. The acid phosphatase level was normal, and there was no evidence of local extension. From the spring of 1948 to September, 1950, he was followed in the urology clinic and intermittently received diethylstilbestrol in doses of 15 to 100 mg. per day. The only urinary symptom was mild nocturia. Bone metastases to the skull and pelvis were discovered by x-ray examination in July, 1950. Because of increasingly severe pain in the lower back and the right knee, an orchiectomy was recommended.

On admission the temperature was 99.4 F, the pulse rate 84, respirations 20, and blood pressure 140/90. The skin over the neck was atrophic and pigmented, a secondary result of radiation. No petechiae, ecchymoses, or jaundice were noticed. The lymph nodes were not enlarged, and the spleen was not palpable. There were no masses in the neck. The prostate gland was small, hard, irregular, and fixed.

The complete blood cell count revealed a hemoglobin concentration of 10 gm. per 100 cc., 3,330,000 red blood cells per cubic millimeter and 7,350 white blood cells per cubic millimeter, with a normal differential count. The urinalysis showed a specific gravity of 1.015 and albumin (2+), but otherwise the urine was normal. The serum alkaline phosphatase value was 7.2 Bodansky units, the serum acid phosphatase value was 36.8 Gutman units and the erythrocyte sedimentation rate was 11 mm. in one hour (Westergren). The blood urea nitrogen level was 17 mg. per 100 cc. and the fasting blood sugar level, 136 mg. per 100 cc. Serum proteins were 6.5 gm., per 100 cc. An electrocardiogram taken on admission showed an abnormal record typical of left ventricular hypertrophy and evidence of an anterior myocardial infarction of unknown date. Skeletal roentgenograms showed extensive osteoblastic metastases.

On September 25, a bilateral orchiectomy was done under thiopental (pentothal®) sodium, nitrous oxide, and oxygen anesthesia. The procedure was uneventful, and the amount of bleeding at operation did not appear to be unusual. Immediately after the operation the patient bled considerably from the wound, the dressing being soaked with blood and requiring several changes despite exertion of pressure. Approximately 15 hours after the operation he complained of severe anterior squeezing chest pain and weakness. He was apprehensive, pale, and clammy. The radial pulse was weak at the rate of 80 per minute, the heart sounds were distant, and the blood pressure was 120/70. There were no signs of congestive failure. The electrocardiogram taken at that time showed changes suggestive of a recent myocardial infarction. The hematocrit reading was 26%. He was treated with oxygen and sedation.

Pressure dressings failed to stop the bleeding, and a large ecchymotic area appeared over the scrotum, extending down over the perineum and up over the lower part of the abdomen and inguinal regions. Venipunctures continued to ooze for 24 hours. The clotting time of venous blood and the prothrombin time were markedly prolonged at this time. Because of these abnormal findings, other coagulation studies were undertaken. The patient was treated with fresh whole blood transfusions to combat blood loss and to correct the clotting defect. However, he continued to go downhill in a state of circulatory collapse and died of cardiac insufficiency 40 hours after the operation. Permission for autopsy was refused.

Blood Coagulation Studies.—Venous clotting time determinations were performed according to a modification of the Lee-White technic,[5] using 1 cc. of blood in each of four saline-rinsed 75 by 10 mm. test tubes. (Normal values range up to 20 minutes.) This patient's blood had not clotted 18 hours after venipuncture.

Admixture of normal blood in the ratio of approximately 1:10 reduced the venous clotting time of more than 18 hours to three minutes.

From the Department of Medicine, College of Physicians and Surgeons, Columbia University, and the Presbyterian Hospital.

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The prothrombin time by the Link-Shapiro [6] modification of the Quick one-stage technic (normal 15±1 sec.) was more than 200 seconds on two specimens.

The plasma prothrombin assay [7] by the two-stage method [8] (with Factor 5 added) was 70% of normal.

The thrombocyte count by the direct method was 72,000 per cubic millimeter (normal 150,000 to 250,000).

Fibrinogen was demonstrated to be present by the coagulum formed when the plasma was heated to 56 C for five minutes. Later studies by electrophoretic analysis revealed that the fibrinogen was reduced to approximately 50% of normal.

Factor 5 was assayed [7] according to the method of Flynn and Stanley [9] and revealed a marked decrease (less than 10% of normal) of this activity from the plasma.

Results of electrophoretic analysis of plasma in phosphate buffer solution with a pH of 7.4 were not strikingly abnormal, revealing 47.8% albumin, alpha-1 globulin 11.3%, alpha-2 9.6%, beta 17.4%, fibrinogen 2.6%, and gamma globulin 11.3%.

COMMENT

This man had an extremely severe hemorrhagic dyscrasia. It is apparent that there was a moderate decrease in thrombocytes, fibrinogen, and prothrombin. However, the magnitude of the bleeding abnormality was out of proportion to these moderate divergencies.

*Clinical and Laboratory Characteristics of Two Patients with Parahemophilia**

	Case 1 (Owren)	Case 2 (Cosgriff and Leifer)
Age, yr.	29	66
Sex	F	M
Underlying disease	None	Metastatic carcinoma
Family history of bleeding	None	None
Bleeding tendency duration	26 yr.	36 hr.
Site	Retinal, nasal, menstrual, joint, skin ecchymoses	Operative area
Thrombocytes/cu. mm.	400,000	72,000
Venous clotting time †	25 min.	18+ hr.
One-stage prothrombin time, sec.	70-80	200+
Fibrinogen	Normal (300 mg. %)	50% Normal
Factor 5	Markedly decreased; less than 10% of normal	Markedly decreased; less than 10% of normal

* Both patients had normal blood cell counts with no demonstrable circulating anticoagulant.

† The addition of normal blood to venous blood of both patients caused a return of the clotting time to normal.

The observation that a small amount (0.1 to .02 cc.) of normal blood caused the patient's blood (1 cc.) to clot almost instantly may be interpreted as excluding the presence of a circulating anticoagulant and indicating a clotting factor deficiency.

The profound decrease of Factor 5 is compatible with the marked prolongation of the coagulation time of venous blood and one-stage prothrombin time.

Although Factor 5 has been of extreme interest from the research viewpoint in the laboratory, this patient is only the second with a clinical hemorrhagic tendency in whom Factor 5 deficiency has been reported as the major coagulation abnormality in the hemorrhagic state. In the accompanying table the clinical and laboratory characteristics of Owren's patient [1] and of the patient reported here are compared. In this second patient the severity of the hemorrhagic tendency and the degree of abnormality of the clotting and prothrombin times were more pronounced than in the patient studied by Owren. In both patients the clotting abnormality appears to be temporarily remediable by transfusion with normal blood.

Factor 5 is found in the globulin portion of the plasma proteins. Electrophoretic analysis was not reported in Owren's case; electrophoretic study of the plasma proteins in our patient revealed nothing essentially abnormal except for some increase in the alpha-1 globulin. In this patient the deficiency of Factor 5 was apparently an acquired one, but the cause is unknown.

SUMMARY

A severe hemorrhagic dyscrasia was encountered in a 66-year-old man. There was a marked decrease of accelerator globulin (Factor 5) in the patient's blood. This Factor 5 abnormality appears to have been acquired and to have been the major factor responsible for extensive postoperative hemorrhage.

180 Fort Washington Ave. (Dr. Cosgriff).

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TETRAETHYLTHIURAMDISULFIDE (ANTABUSE®) THERAPY

REPORT OF TWO CASES

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and
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About two years ago reports began to appear in the medical literature on the use of a substance, tetraethylthiuramdisulfide, more popularly known as antabuse.® The ingestion of this substance appeared to sensitize persons to the use of alcohol. In a patient receiving as little as 500 mg. of tetraethylthiuramdisulfide daily, the ingestion of 30 cc. or more of gin or its alcoholic equivalent will shortly be followed by symptoms that include a feeling of heat in the face and intense flushing of the face, and sometimes of the neck and chest. Probably the most characteristic effect is dilatation of the scleral vessels. A little later, palpitation and dyspnea develop, and in severe cases nausea and vomiting occur. These symptoms usually disappear within a few hours, leaving the person rather sleepy.

Production of the above-described symptoms depends upon the fact that in the presence of tetraethylthiuramdisulfide considerable quantities of alcohol are converted into acetaldehyde. The same train of symptoms can be reproduced by intravenous infusion of acetaldehyde directly into the bloodstream. In the absence of alcohol the tetraethylthiuramdisulfide circulates in the bloodstream unchanged and is gradually eliminated, mostly by the kidneys, over a four to five day period after administration is stopped.

The drug is well tolerated by humans in doses vastly larger than those commonly employed, though it is contraindicated in persons suffering from kidney, heart, or

liver damage. It is usually offered in 500 mg. tablets. Patients may be given three tablets daily for three to four days, after which two tablets daily are given for four to five days. Most patients can be maintained on one tablet daily, though some are said to require one and one-half to two tablets. The effectiveness of the blood level of the drug can be tested at any time, since the ingestion of a glass or two of beer should be enough to evoke a mild reaction when the proper level is maintained. Sensitivity reactions are apparently rare, and most authors appear to feel relatively secure about the use of the drug in the clinical treatment of alcoholism. With this in mind, then, and with an eye to the fact that its use is apparently about to become much more widespread, it is felt that any untoward reactions connected either directly or indirectly with the employment of tetraethylthiuramdisulfide should be of interest and concern to the medical profession.

Following is a brief report of two cases of alcoholism in which this drug was used. While it is not possible to state as a certainty that the reactions reported were due to tetraethylthiuramdisulfide, and, if so, the exact modus operandi, nevertheless, under the circumstances it seems a reasonable assumption to make.

CASE 1.—A 56-year-old woman had been troubled with mild recurrent depressions since the death of her husband 10 years previously. For the last five years she had been a problem to her family because of a tendency toward impulsive and excessive drinking occurring during the periods of depression. Inasmuch as the depressive intervals occurred two to three times a year and lasted for three to eight weeks, the management of the patient's alcoholic proclivities at these times was completely unsatisfactory from a medical viewpoint and very distressing in terms of family relationships.

It was felt that tetraethylthiuramdisulfide might prove to be the answer in this situation. The patient was admitted to the institute, where she was given three 500 mg. tablets daily for the first four days, then two daily for four more days, and after that a maintenance dose of one tablet daily. On the eighth day of hospitalization she began to complain of feeling a little confused at times, and it was noted that she appeared somewhat tense, agitated, and anxious. The next day, though she had no further complaints, the same symptoms prevailed and it was noted that she looked a bit suspicious. By the following day an outright psychosis had developed. She was suspicious, heard voices talking about her, and felt that there was a "court order" out for her and that she must find out who was behind the plot. She stated she heard the physician and nurse talking all night outside her door and demanded to know what it was all about.

Administration of tetraethylthiuramdisulfide was discontinued at this point, but for the next five days the acute paranoid episode continued, at the end of which time it cleared up very suddenly, within 24 hours. The findings on the physical and neurological examinations, both before and during the attack were normal. The case has been followed since that time, and there has been no further deviation from the original clinical picture.

CASE 2.—A 36-year-old man gave a history of alcoholism for the past 20 years. At the age of 16 his father, who was an alcoholic, used to take him on drinking bouts for company. The patient said, "I had to get drunk myself to be able to stand it." Since his discharge from the Navy in 1945, his drinking had got completely out of his control, so that he was unable to work, to maintain ordinary social relationships, or even to be a patient for more than a few weeks in any but a closed-ward hospital.

Intensive, long-term psychotherapy was of no avail. The patient was never able to talk about himself except on a most superficial level, and one always felt that no real rapport existed between the physician and the patient. It was hoped, therefore, that with tetraethylthiuramdisulfide he might be controlled well enough to make a reasonable adjustment. The patient was hospitalized and placed on a dosage of one 500 mg. tablet of the drug three times daily for four days; then one tablet was administered twice daily for a week, at which time a maintenance dose of one tablet daily was instituted. After 10 days in the hospital he began to complain of feeling confused at times, and it was noted that for the first time in the course of his illness he appeared anxious. During the next week he became progressively more confused, until he was completely unmanageable and had to be transferred to a closed ward. Use of tetraethylthiuramdisulfide was discontinued when confusion became noticeable.

After transfer the patient became acutely psychotic. For the next three weeks he was completely disoriented as to time, place, and person. He had hallucinations of fires, bombings, and various episodes of mass destruction. He accused the therapist of attempting to castrate him and threatened retaliation in kind. Though never actually making assaults during this period, he frequently seemed on the verge of doing so. During the last two weeks in the hospital his mental status cleared progressively, and he was discharged.

Admission physical and neurological examinations, as well as several subsequent checkups, gave normal findings. The patient has been followed until about six months ago, and it is interesting that he has been able to control his alcoholic intake reasonably well since discharge.

CONCLUSIONS

It is generally accepted that alcoholism is a defense, or the acting-out of defenses, against unconscious conflicts that are extremely frightening to the patient. Alcohol is necessary to a person, therefore, in direct ratio to his fear of these conflicts breaking through into consciousness. In patients who have suddenly stopped drinking through sheer force of will, as it were, it is not uncommon to see a pronounced personality change as new defenses are acquired. The families of these persons, in fact, not too infrequently state that the alcoholic personality was better than the postalcoholic one. It is felt that in the two cases here reported, the patients, when threatened with a breaking through of strong and uncontrollable conflictual feelings, habitually and instinctively dealt with the situation by sedating themselves to coma or near-coma point with alcohol. Because tetraethylthiuramdisulfide made them unable to tolerate alcohol, this protection was denied them, with the result that a complete personality disintegration took place.

It is noteworthy that neither of these patients wished to take the drug and agreed to it more because of the insistence of relatives than because of any real desire on their own part.

There is general agreement that all alcoholics are psychologically unstable persons and that not a few are extraordinarily sick. With this in mind, it is probable that with the widespread and continued use of tetraethylthiuramdisulfide such cases as those described might not be too uncommon and that psychosis as a concomitant of therapy with the drug is something to guard against.

111 N. 49th St. (Dr. Strecker).

Splenectomy in Purpura of Children.—Adequate criteria for splenectomy in idiopathic thrombopenic purpura of children have not been established. Viewed against the background of the natural course of the disease, successful results in cases treated by early splenectomy cannot be attributed to the operation, since spontaneous recovery is the rule. In chronic cases, splenectomy may or may not result in a cure. Splenectomy in children should probably be reserved for cases of uncontrollable bleeding and chronic recurrent purpura.—William A. Newton, Jr., and Wolf W. Zuelzer, M.D., Idiopathic Thrombopenic Purpura in Childhood, *The New England Journal of Medicine*, Dec. 6, 1951.

COUNCIL ON PHARMACY AND CHEMISTRY

REPORT TO THE COUNCIL

The Council has authorized publication of the following report to the Committee on Research, a standing committee of the Council on Pharmacy and Chemistry.

R. T. STORMONT, M.D., *Secretary.*

The Committee on Research has adopted the following report on khellin. This research project was made possible by a contract grant from the Physicians Drug and Supply Company to the investigators through the Committee on Research.

PAUL L. WERMER, M.D., *Secretary.*

CLINICAL AND EXPERIMENTAL STUDY OF USE OF KHELLIN IN TREATMENT OF ANGINA PECTORIS

Herbert N. Hultgren, M.D.
H. Schuyler Robertson, M.D.
and
Leyland E. Stevens, M.D., San Francisco

Khellin is a crystalline extract of a crude drug which has long been used in Egypt for the treatment of ureteral colic.[1] The pure crystals were independently isolated in 1930 by Fantl and Salem [2] and by Samaan.[3] Further studies of its chemical structure were made by Spaeth and Gruber [4] in 1941. Animal experiments later demonstrated that khellin is a coronary dilator with an action greater than that of aminophylline but not as great as that of amyl nitrite.[5] Khellin's duration of action is prolonged and it is relatively nontoxic and free from undesirable circulatory side-effects. These results prompted Anrep and his workers to use it clinically in patients with angina pectoris.[5] They found that the daily oral administration of khellin to 250 patients with mild to severe angina resulted in the complete cessation or a significant reduction in frequency and intensity of attacks in 140 patients.[5c] Since then several clinical trials of khellin in angina pectoris have been made. Most reports indicate favorable results.[6] One carefully controlled study indicated that it was of no value.[7] Khellin has also been used in bronchial asthma [6a,h] and in pertussis.[8]

This report will present the results of a clinical and experimental evaluation of khellin in the treatment of selected cases of angina pectoris observed during the past 18 months at the Stanford Hospital.

METHOD

Patients were selected who experienced from 1 to 30 attacks of angina during ordinary daily activity and who demonstrated that they were cooperative and reliable observers of their symptoms. The diagnosis of angina pectoris had been verified by careful study in the outpatient clinic and in most instances diagnostic changes in the electrocardiogram were observed after exercise (fig. 1). A "blind test" technique similar to that described by Greiner and co-workers [7] was employed. Each patient kept a daily report card on which he recorded the time each attack of pain occurred, the number of glyceryl trinitrate (nitroglycerin) tablets used, and any symptoms that might be caused by the medication being given. Patients were usually seen at weekly or biweekly intervals and their cards were examined and verified. Studies were controlled by not giving medication for the first week or two. Patients were then given a numbered box containing either 50 mg. tablets of khellin or identically appearing and tasting, inert placebos. The nature of the medication was unknown to the patient and usually to the person conducting the test. An effort was made to alternate periods of placebo and khellin administration with periods during which a report card was kept but tablets were not given. At the conclusion of the study the data on the report cards were tabulated and the results summarized.

TABLE 1.—*Toxic Effects of Khellin in Twenty-Five Cases*

Gastrointestinal Symptoms	General Symptoms	Miscellaneous Symptoms (rare)
Anorexia	Weakness	Loose stools
Nausea	Fatigue	Increased perspiration
Vomiting	Depression	Increased salivation
	Confusion	Postural hypotension
		EKG changes

TABLE 2.—*Minimal Toxic Doses of Khellin in Twenty-Two Cases*

Milligrams per day	25	50	75	100	125	150	200	300
Number of cases....	1	3	1	4	1	7	3	2

RESULTS

Of the entire group of 30 patients studied, 14 were followed for a sufficient length of time and were considered reliable enough observers to warrant inclusion in this report. The results are summarized in figure 2. The vertical columns indicate the mean frequency of attacks per period of six days. A six day period was selected because, initially, most report cards covered this period of time, the seventh day of the week usually not being recorded since medication frequently was changed on that day. Later, when the dose was adjusted, two week periods of observation were used. The total number of days the patient was studied on each regimen is indicated below each vertical column. A similar graph was constructed for glyceryl trinitrate requirements, but the results were so comparable to the frequency of pain that a presentation of only one graph is necessary.

The 14 patients can be divided into two groups of 7 each: (1) Those who experienced a distinct reduction in frequency of anginal attacks (30% or more) while receiving khellin, compared with control periods of placebo administration. Their data are summarized in the upper portion of the figure. (2) Those who experienced no significant reduction (less than 25%) in anginal attacks during khellin administration. Their data are summarized in the lower portion of the figure.

From the Department of Medicine, Stanford University School of Medicine.

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It would appear that khellin is of some value in the treatment of angina pectoris. It should be noted, however, that all of the patients apparently benefited by the drug experienced some toxic symptoms as indicated by plus (+) signs. These symptoms varied in severity from mild malaise and anorexia to nausea and vomiting. Several patients said that when they experienced such symptoms they decreased their physical activity. Some patients preferred to stay at home or rest in bed if the symptoms were severe. An attempt was made in every instance to use a dose of khellin that would be therapeutically effective yet not toxic enough to influence activity. Sometimes several weeks were necessary to make this adjustment and even on such a dose occasional mild anorexia or malaise was noted. Thus the effect of the medication on the total activity of the patients studied was unknown and not subject to complete control in the usual doses given. For this reason it could not be determined whether this apparent beneficial effect of khellin was due to a reduction in the patient's daily activity as a result of the side effects of

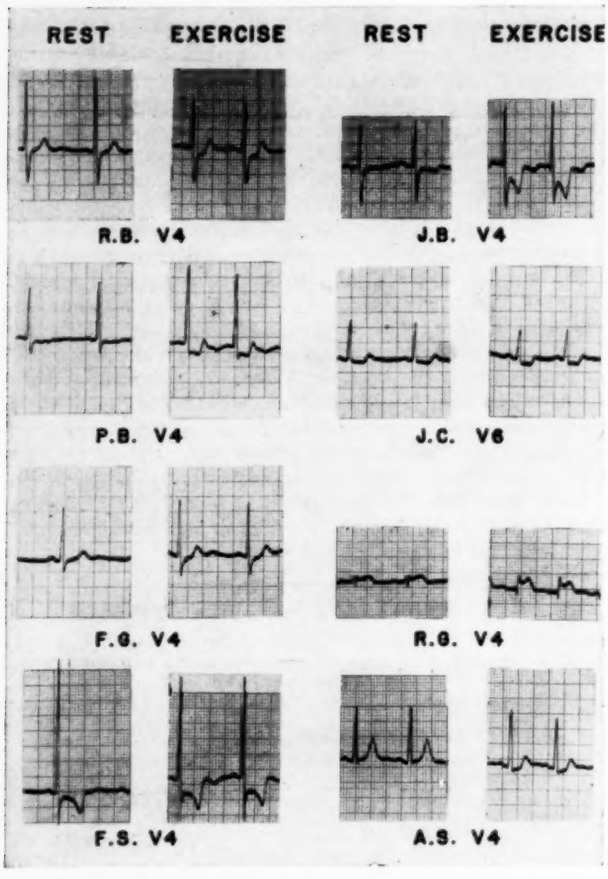

Fig. 1.—Control electrocardiographic changes occurring during exercise in patients who were given khellin parenterally.

the drug or due to a pharmacologic action upon the coronary circulation. Therefore evaluation of the preparation was sought by more objective methods.

At this point it may be expedient to describe briefly the toxic symptoms encountered with the oral administration of khellin. The principal symptoms noted are summarized in Table 1. The typical order of appearance is as follows: About 48 to 96 hours after starting the drug, the patient notices a disinclination to eat. This gradually progresses to complete anorexia and the appearance of mild nausea after meals. Vomiting and retching may occur if the drug is continued. Occasionally nonspecific symptoms may predominate. Weakness, fatigue, "sick all over," "lack of pep," "rum dum," and "woozy" are the usual terms employed by the patients. When the drug is stopped, the symptoms gradually subside and disappear in approximately 48 hours.

9. Lipman, B. S., and Massie, E.: A Report on the Use of Khellin in Angina Pectoris, J. Lab. & Clin. Med. **36**: 956, 1950.

The smallest daily dose required to produce toxic symptoms varies widely among patients as indicated in Table 2. One patient had mild malaise and anorexia while taking one 50 mg. tablet of khellin every other day. This was carefully studied and verified by alternate periods of placebo administration when no toxic symptoms were noted. Two patients were able to take consistently 300 mg. daily without apparent toxic symptoms. These results are comparable to those obtained by other workers.[9]

There was some indication that higher daily doses of khellin could be tolerated when given intramuscularly than when given orally. For example, in one patient (P. B.) anorexia readily developed with an oral dose of 150 mg. per day, but there were no symptoms when the patient received 210 mg. a day intramuscularly. A second patient (R. B.), who always became nauseated when receiving 100 mg. of khellin daily by mouth, tolerated 175 mg. a day intramuscularly without symptoms. No systematic studies were made on this subject, however.

None of the toxic symptoms were serious. A potential danger, however, was encountered in one patient who had congestive failure and angina decubitus. After a careful control period of placebo administration, a dosage of 150 mg. of khellin given orally every day was started. Twenty-four hours later nausea and vomiting occurred accompanied by great psychic disturbance which resulted in an increase in severity and frequency of angina. The slow excretion of the drug became uncomfortably apparent in this instance.

In an effort to obtain a more objective appraisal of the effect of khellin upon the coronary circulation, eight patients were

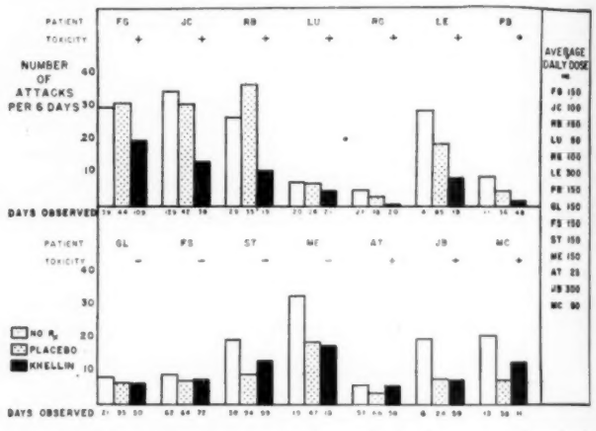

Fig. 2.—Effect of khellin given orally upon the frequency of angina in 14 patients studied by the "blind test" technique.

selected in whom graded exercise consistently produced chest pain accompanied by diagnostic alterations in the electrocardiogram. Exercise was performed using standard steps similar to those described by Master.[9a] Patients exercised at a constant rate, so that any increase in exercise capacity would be indicated by an increase in the number of trips the patient was able to make. After a control exercise period during which chest pain and electrocardiographic changes appeared, the patient was allowed to rest for 40 minutes after which the electrocardiogram returned to its preexercise appearance. A 1/150 grain (0.40 mg.) tablet of glyceryl trinitrate was then placed under the tongue and allowed to dissolve. Five minutes later exercise was performed in an identical manner. As illustrated in figure 3, every patient studied exhibited a significant increase in exercise capacity. On subsequent days, usually a week or more apart, the study was repeated using, instead of glyceryl trinitrate, single injections of khellin given deep into the gluteal muscles in doses varying from 50 to 150 mg. or intravenous injections in doses of from 30 to 60 mg. The injections alone did not produce a change in the electrocardiogram. Fifteen to 20 minutes were allowed to elapse after the intramuscular injections and 5 to 10 minutes after the intravenous injections before exercise was performed. The results of this study are indicated in figure 3. A consistent change in exercise capacity was not noted after either route of administration. One patient (F. S.) was able to perform more exercise after 75 mg. of khellin intramuscularly; but when the

test was repeated using 100 mg. of khellin four months later, no increase in exercise capacity was noted. Two patients (F. G. and F. S.) showed somewhat less striking electrocardiographic changes on exercise following intramuscular administration of khellin compared to the control test, but exercise capacity was not increased nor pain intensity decreased. It was apparent that no beneficial effect of khellin upon induced angina had been demonstrated by the above method of study.

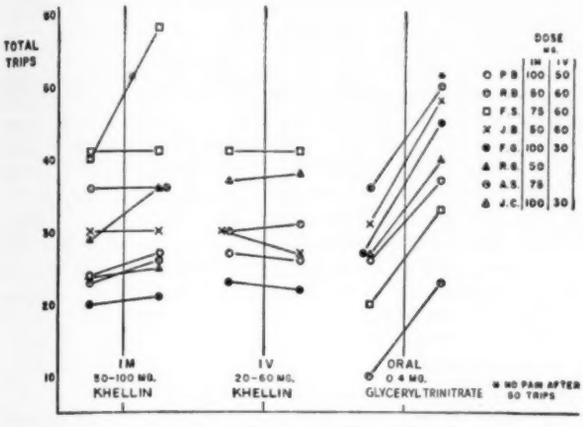

Fig. 3.—Effect of khellin given parenterally compared to glyceryl trinitrate given orally upon the exercise capacity of eight patients with angina pectoris. Control exercise capacity is indicated to the left of the vertical lines with exercise capacity after medication indicated to the right.

It is possible that khellin may not manifest its maximum pharmacologic effect until several hours or days after administration. This was suggested by the delay in appearance of toxic symptoms after starting the oral preparation. If khellin did act in this manner, another type of experiment would have to be devised in order to test its effect upon angina pectoris. Therefore the following plan was followed. Five patients were selected from the previously studied group of eight described above

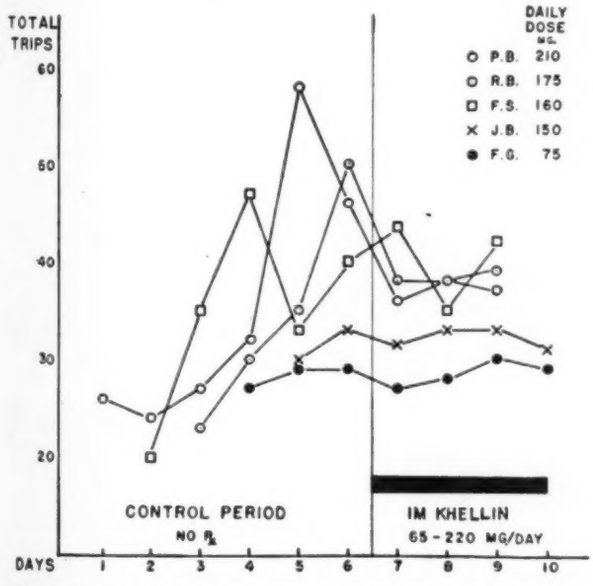

Fig. 4.—The effect of daily intramuscular administration of khellin upon the exercise capacity of five patients with angina pectoris.

and hospitalized for periods of five to eight days. During this time they were allowed to remain ambulatory and continue normal activity so that enforced bed rest would not alter their exercise capacity. At the same time of day and under identical conditions, exercise tolerance tests as previously described were performed. This was continued for a control period of two to six days during which no medication was given. Khellin was then administered intramuscularly three times daily in dosages of 75 to 210 mg. per day. Exercise tests were repeated daily under identical conditions. As illustrated in figure 4, consistent improvement in exercise capacity was not noted despite daily dosages which, in two patients, were larger than the minimum daily oral toxic dose. No changes were noted in the appearance of the electrocardiogram during the period of khellin administration. The electrocardiographic changes occurring during exercise were not different from those obtained during the control period.

The above data suggest that neither single parenteral doses of khellin nor daily maintenance doses given intramuscularly had any demonstrable effect in increasing the exercise capacity of patients with angina pectoris. The possibility remained that khellin may have some effect on other circulatory features such as cardiac output, systemic blood pressure, or pulmonary artery pressure which would favorably influence the course of angina. The possibility that some favorable effect could be produced upon pulmonary artery pressure was suggested by the prompt beneficial results reported in patients with bronchial asthma and cor pulmonale by one group of workers.[9h] To test this possibility,

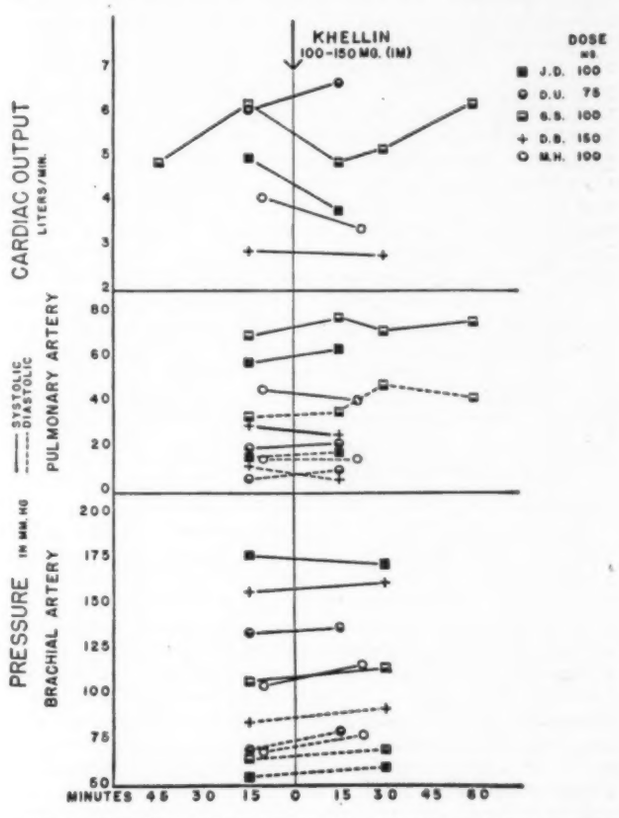

Fig. 5.—The effect of single intramuscular injections of khellin upon the circulation in five patients.

five patients were selected and studied carefully under basal conditions. Four patients had distinct alterations in various circulatory functions. One patient had a small interventricular septal defect but was essentially normal in all other respects. A brief summary of the important features of these cases appears at the end of this paper.

METHOD

Cardiac output was determined by the Fick principle. Mixed venous blood was obtained by means of a cardiac catheter with the tip located in the main pulmonary artery. Blood oxygen analyses were performed in a Van Slyke apparatus. Arterial blood samples were collected through a Cournand needle inserted into the brachial artery. Oxygen consumption was measured by collecting expired air in a Tissot apparatus and determining the oxygen and carbon dioxide content in a Henderson-

9a. Master, A. M., and Oppenheimer, E. T.: Simple Exercise Tolerance Test for Circulatory Efficiency with Standard Tables for Normal Individuals, Am. J. M. Sc. **177**: 223 (Feb.) 1929.

Haldane apparatus. Blood pressures were recorded optically by means of Hamilton manometers connected to the cardiac catheter or the inlying arterial needle. Control observations were made at ten to fifteen minute intervals prior to the administration of khellin as indicated in figure 5. A single intramuscular injection of 75 to 150 mg. of khellin was then given, and further observations were made as indicated.

RESULTS

No consistent significant changes in cardiac output or in pulmonary artery or brachial artery pressure were noted following khellin administration, despite resting deviations of these values from the normal range in four patients, due to disease. These patients had slight decreases in cardiac output, but in one patient this was not sustained. There appeared to be a very slight rise in systolic and diastolic arterial pressures in all cases. No toxic symptoms were experienced by the patients, except some local pain and tenderness at the injection site. These observations are in agreement with those made in a similar study by Zimmerman.[10]

At this point it may be advantageous to describe briefly the local discomfort produced by the parenteral administration of the particular preparations of khellin studied. Three-fourths of all patients receiving intramuscular injections complained of prompt deep burning or aching pain at the injection site lasting from 1 to 10 minutes after the injection and occasionally followed by a transient aromatic odor or bitter taste. Two patients given daily intramuscular injections of khellin in the hospital complained about the discomfort of the injections and stated that they would be unable to tolerate a prolonged course of therapy by this route. The concentration of only 50 mg. of khellin in 3 cc. of vehicle proved inconvenient when large daily doses of 300 mg. or more were given. Intravenous administration produced even more discomfort. In nearly every instance, prompt severe local burning pain appeared at the injection site as soon as administration began and traveled up the arm to the shoulder. This pain in several instances was quite intense and lasted from 2 to 10 minutes. No perivenous injections occurred, and no subsequent venous thromboses appeared. Clearly there is a need for more concentrated parenteral preparations which are free from these uncomfortable local reactions.

DISCUSSION

The difficulties of evaluating any therapeutic agent for a condition as variable and subjective as angina pectoris has been commented on by others.[11] Undoubtedly, the blind test technique [7] offers the best method of evaluation when one must depend for data on a record of the patient's symptoms. The effect of inert preparations in reducing the frequency of anginal attacks compared to control periods when no medication was given can be easily seen in figure 2. This has been noted by many others.[11] However, even this method of study has limitations. An adequate number of patients must, of course, be studied to be certain of a proper sample. It is important to continue the study for an adequate period of time, alternating the placebo and medication constantly to correct for temporal variations in the frequency of anginal attacks. Probably the most serious obstacle, however, in conducting a proper "blind test" program in the evaluation of oral khellin administration is the high incidence of toxic symptoms occurring often with doses of the drug which may be too small to have any physiologic effect upon the coronary circulation. The test, of course, fails to be a true "blind test" when the patient is aware of anorexia and nausea occurring with one box of tablets and absent with another. Equally important is the tendency, previously discussed, of patients to decrease their physical activity when experiencing toxic symptoms.

Most of these disadvantages can be eliminated by parenteral administration and by utilizing more objective means of study. The results obtained by such methods in this study indicate that khellin has strikingly little effect on angina pectoris induced by exercise and no effect upon other circulatory functions. Its continued clinical employment seems, therefore, of dubious value.

However, the possibility remains that the dosages employed have been too small to elicit the desired effects. Studies of blood levels of khellin are needed. Oral preparations allowing larger daily dosage with less toxicity and more concentrated parenteral preparations, which can be given without discomfort, may demonstrate more encouraging effects on the coronary circulation in man.

SUMMARY

1. Utilizing the "blind test" technique to evaluate the effect of oral khellin in a carefully selected group of 14 patients with angina pectoris induced by effort, it was found that 7 patients experienced a reduction in the frequency of their anginal attacks when compared to similar periods of placebo administration.

2. It could not be determined whether this reduction was related to a decrease in physical activity caused by toxic reactions to the drug or to an actual effect on the coronary circulation.

3. More objective methods of study utilizing exercise tolerance tests performed before and after parenteral administration of khellin and compared with glyceryl trinitrate (nitroglycerin) failed to reveal any beneficial effect in eight patients.

4. Daily intramuscular administration of khellin failed to improve the exercise capacity in five patients.

5. Intramuscular administration of 100 to 150 mg. of khellin failed to produce any effect upon cardiac output, pulmonary artery pressure, or systemic arterial pressure in five patients with various circulatory disorders.

6. The high incidence of systemic and local toxic reactions was discussed and its effect upon the data obtainable by the "blind test" method of study was pointed out.

7. On the basis of this study, further clinical use of khellin appears of doubtful value but studies at higher dosage levels are indicated.

APPENDIX: CLINICAL SUMMARIES OF PATIENTS STUDIED BY CARDIAC CATHETERIZATION

1. J. D. is a 71-year-old white bartender who had been unable to work because of dyspnea on exertion, orthopnea, and edema of the feet and legs for the past 12 years. During that time he had many attacks of wheezing and tightness in his chest, coming on usually at night and relieved by aminophylline suppositories or inhaling fumes of stramonium and belladonna powder. Digitoxin, mercurial diuretics, and a low salt diet were administered in the outpatient clinic. Physical examination revealed an elderly, dyspneic man with a blood pressure of 170/90. The thorax was emphysematous, and numerous moist rales and expiratory wheezes were present throughout the chest. A grade 2 systolic murmur was heard at the apex. There was mild edema of the ankles. The hemoglobin was 11 gm., and urinalysis revealed a trace of protein. The vital capacity was 1.6 liters, and the arm to tongue circulation time (using sodium dehydrocholate) was 30 seconds. The electrocardiogram revealed left bundle branch block with auricular fibrillation and complete auriculoventricular block. Roentgenograms revealed generalized cardiac enlargement with minimal pulmonary congestion. Arterial oxygen saturation was 89%. The clinical diagnosis was arteriosclerotic heart disease and cor pulmonale secondary to chronic bronchial asthma.

2. D. U. is a 45-year-old white housewife who had progressively severe dyspnea on exertion accompanied by frequent bouts of chills and fever for the past three years. Dyspnea had been so severe during the past six months that she had been confined to bed. Careful studies for tubercle bacilli were negative. Examination revealed a thin, weak, dyspneic woman whose blood pressure was 118/72. Respiration was rapid and accompanied by numerous inspiratory wheezes and rales over both lung fields. There was no clubbing of the digits. The hemoglobin was 14.8 gm., and the urine was normal. Vital capacity was 500 cc. The electrocardiogram revealed right axis deviation. Roentgenograms of the chest revealed diffuse pulmonary infiltration and fibrosis. Arterial oxygen saturation after mild exercise was 84%. The clinical diagnosis was pulmonary fibrosis and infiltration of unknown etiology and possible cor pulmonale.

10. Cash, H., and Zimmerman, H.: A Study by Means of Intracardiac Catheterization of the Effect of Khellin on Cardiac Output and the Pulmonary Circulation in Man, Am. J. Med. **10**: 515 (April) 1951.

11. Evans, W., and Hoyle, C.: Comparative Value of Drugs Used in Continuous Treatment of Angina Pectoris, Quart. J. Med. **2**: 311 (July) 1933. Gold, H. (New York); Kwit, N. T., and Otto, H.: Xanthines (Theobromine and Aminophylline) in Treatment of Cardiac Pain, J. A. M. A. **108**: 2173 (June 26) 1937.

3. G. S. is a 46-year-old white truck driver who had chronic bronchial asthma with progressive impairment of activity since the age of 13. He had no symptoms of heart failure. Physical examination revealed a middle-aged man who was slightly cyanotic. Numerous expiratory wheezes were heard throughout the chest, which had an emphysematous contour. The heart was not remarkable. Blood pressure was 115/85; hemoglobin, 17.5 gm., and the urine, normal. The vital capacity was 1.5 liters and after epinephrine was administered increased to 2.5 liters. The electrocardiogram revealed a slight right axis deviation and abnormal T waves. The roentgenogram revealed emphysematous changes and enlargement of the right ventricle and pulmonary artery. The arterial oxygen saturation was 74%. The clinical diagnosis was cor pulmonale secondary to chronic bronchial asthma.

4. D. B. is a 27-year-old white carpenter who was found to have a heart murmur in a routine examination two years ago. He has had no symptoms. Physical examination revealed a well muscled male with a blood pressure of 120/70. A grade 4 systolic murmur accompanied by a palpable thrill was heard in the fourth interspace along the left sternal border. There was no clubbing or cyanosis. The blood cell count, urinalysis, electrocardiogram, and chest roentgenogram were within normal limits. The clinical diagnosis was congenital heart disease with an interventricular septal defect. The diagnosis was confirmed by cardiac catheterization.

5. M. H. is a 47-year-old housewife who has had a heart murmur for the past 20 years. Fifteen years ago she developed dyspnea on exertion and was found to have mitral stenosis. Her symptoms have progressed so that she now can do her housework only with great difficulty and she has had numerous episodes of pulmonary edema. Examination revealed a thin woman with a loud second pulmonic sound and a prominent apical diastolic rumbling murmur. There was no edema. The blood pressure was 120/80. The electrocardiogram revealed a sinus rhythm with abnormal T waves. X-ray examination revealed right ventricular enlargement, pulmonary congestion, and fulness of the left auricle. She was considered suitable for a "finger-fracture" of the stenotic mitral valve and was scheduled for surgery.

The following preparations of khellin, supplied by The Physicians' Drug and Supply Company of Philadelphia, were used in this study: tablets containing 50 mg. of khellin for oral use; ampules containing 50 mg. of khellin in olive oil and ethyl acetate for intramuscular use; and ampules containing 30 mg. of khellin in a 40% solution of sodium benzoate for intravenous use. These preparations contain only pure khellin as determined by spectrophotometric analysis and melting point determination and are not mixtures with other material.

ADDENDUM

Since this article was submitted for publication the following significant paper has been published: Silber, E. N.; Snider, G. L.; Goldberg, H.; Katz, L. N., and Radner, D. B.: The Effect of Khellin on Cardio-Pulmonary Function in Chronic Pulmonary Disease (*J. Clin. Invest.* **30**:1046 [Oct.] 1951).

Emotions in Dermatology.—Every thinking dermatologist has recognized that emotional factors play a great part in the development and in the course of certain skin diseases. . . . But . . . there is a regrettable tendency to blame them indiscriminately. . . . In many dermatoses ignorance of the cause has led to the psyche being blamed. I prefer to regard a psychogenic explanation as the last resort of the diagnostically destitute. The usual approach is to analyze a series of cases and state that a certain percentage suffered from maladjustments, such as lack of parental love, broken homes, poverty, and so on. But it is remarkable how rarely the frequency of such maladjustments is compared with their frequency in comparable samples of normal persons. . . . Even where such normal controls have been investigated psychologically, it is reasonable to doubt whether the same enthusiasm has been shown in "digging up the dirt" as in those cases being investigated with the avowed object of demonstrating psychosomatic factors.—L. J. A. Loewenthal, M.D., Obsolescent and Debatable Ideas of Dermatology, *South African Medical Journal*, Nov. 17, 1951.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

The Council on Physical Medicine and Rehabilitation has authorized publication of the following article.

RALPH E. DE FOREST, M.D., *Secretary.*

AN APPRECIATION

The Council on Physical Medicine and Rehabilitation expresses its appreciation of the services of the following consultants who so freely gave their assistance in the work of the Council during the year 1951: Dr. Thomas D. Allen, Mr. Robert W. Benson, Drs. Lester Blum, Rowine H. Brown, Raymond Carhart, Mrs. Eva Thompson Carson, Drs. Milton B. Cole, G. de Takats, Donald J. Erickson, Clarence J. Gamble, Aram Glorig, Archer S. Gordon, Stacy R. Guild, John S. Hibben, Howard P. House, John Huffman, I. F. Hummon, Ernest E. Irons, Mary Karp, A. B. C. Knudson, M. M. Kunde, Ludwig G. Lederer, Alfred Lewy, Raymond W. McNealy, A. M. MacKay, Gordon M. Martin, C. O. Molander, Lester A. Nalefski, Louis B. Newman, Benjamin H. Orndoff, Stafford L. Osborne, Mr. H. W. Pavela, Drs. L. W. Peterson, Henry G. Poncher, Gerald H. Pratt, James W. Rae, Mr. Luther G. Ramer, Drs. Herbert Rattner, John Reichert, Joseph E. Remlinger, Arthur A. Rodriquez, Robert S. Schwab, Steven O. Schwartz, S. Richard Silverman, O. E. Van Alyea, H. O. Wernicke, Douglas E. Wheeler, and Jessie Wright.

The following have rendered valuable services as members of Advisory Committees:

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CROSS RESISTANCE TO ANTIBIOTICS

The increased microbial resistance that frequently follows exposure to an antibiotic has generally been considered to be characteristic of the antibiotic itself and not to entail increased resistance to other antibiotics. This viewpoint has been challenged recently by a number of investigators, whose studies have yielded information that may prove of considerable clinical importance and experimental interest.

Preliminary observations [1] indicated that acquired resistance to terramycin was accompanied by decreased sensitivity to aureomycin and that acquired resistance to aureomycin or to chloramphenicol was accompanied by cross resistance to the other agent and to terramycin. Since then, several extensive studies on cross resistance among antibiotics have been reported. Kaipainen [2] from the department of serology and bacteriology of the University of Helsinki cultured 27 different bacterial strains in increasing concentrations of aureomycin, chloramphenicol, terramycin, dihydrostreptomycin, and penicillin. After the resistance of the bacteria to the primary antibiotic was increased, simultaneous changes in sensitivity to the other antibiotics were determined. Organisms developing resistance to aureomycin, chloramphenicol, or terramycin in general showed a simultaneous increased resistance to the other two antibiotics, cross resistance between aureomycin and terramycin being most commonly encountered.

There was no indication of cross resistance between aureomycin, chloramphenicol, and terramycin on one hand and dihydrostreptomycin on the other; in fact, organisms resistant to one or more of the broad spectrum antibiotics often seemed to have acquired increased sensitivity to streptomycin and vice versa. No cross resistance was noted between any of these four antibiotics and penicillin.

Gezon and Fasan [3] from the department of pediatrics of the University of Chicago induced resistance to streptomycin, neomycin, chloramphenicol, aureomycin, and terramycin in each of seven group A β-hemolytic streptococci by serial plate transfer. Cross resistance was noted between terramycin and aureomycin and to a lesser extent between streptomycin and neomycin. Chloramphenicol resistant organisms were as sensitive as their parent strains to each of the other four antibiotics, and no cross resistance was noted between terramycin and aureomycin on one hand and neomycin and streptomycin on the other.

Monnier and Schoenbach [4] of the department of preventive medicine, the Johns Hopkins University School of Medicine, and of the State University Medical Center at New York, respectively, studied the development of resistance in 12 strains of pathogenic organisms following serial transfer in media containing one of a number of antibiotics, i. e., penicillin, aureomycin, chloramphenicol, terramycin, and streptomycin. After the organisms were exposed to one antibiotic, their sensitivity to the other four and to polymyxin D was determined. Organisms which became resistant to terramycin, aureomycin, or chloramphenicol often showed a cross resistance to the other two antibiotics but never showed cross resistance to penicillin or to streptomycin. Similarly, organisms resistant to streptomycin or to penicillin did not show cross resistance to aureomycin, terramycin, or chloramphenicol. No significant change in sensitivity to polymyxin D was noted in the various resistant microorganisms.

Gocke and Finland [5] of the department of medicine of Harvard Medical School repeatedly subcultured 14 strains of aerobic human pathogens on media containing increasing concentrations of aureomycin, terramycin, chloramphenicol, or neomycin. The organisms that developed resistance to neomycin did not show cross resistance to any of the other three antibiotics, and, in fact, increased sensitivity was sometimes noted. Conversely, organisms that had developed resistance to one of the other three antibiotics did not show cross resistance to neomycin. Almost all the neomycin resistant organisms, however, showed considerably greater resistance to streptomycin than did the corresponding control strains. Aureomycin and terramycin showed the development of mutual cross resistance most clearly and regularly. Following exposure to chloramphenicol some strains showed increased resistance to aureomycin and/or terramycin, while others did not. Conversely, some but not all strains rendered resistant to either aureomycin or terramycin also displayed significantly increased resistance to chloramphenicol. None of the organisms showed a change in sensitivity to penicillin following repeated exposures to aureomycin, terramycin, chloramphenicol, or neomycin.

These reports present convincing proof that bacteria rendered resistant in vitro may exhibit cross resistance to one or more other antibiotics. This information may help in elucidating the mode of action of antibiotics. Thus, if the antimicrobial action of antibiotics is due to an interference with one or more of the bacterial enzyme systems, those agents that show cross resistance may

1. Fusillo, M. H., and Romansky, M. J.: The Simultaneous Increase in Resistance of Bacteria to Aureomycin and Terramycin upon Exposure to Either Antibiotic, Antibiotics & Chemother. **1**: 107 (May) 1951. Herrell, W. E.; Heilman, F. R., and Wellman, W. E.: Some Bacteriologic Pharmacologic, and Clinical Observations on Terramycin, Ann. New York Acad. Sc. **53**: 448 (Sept. 15) 1950. Pansy, F. E.; Khan, P.; Pagano, J. F., and Donovick, R.: The Relationship Between Aureomycin, Chloramphenicol, and Terramycin, Proc. Soc. Exper. Biol. & Med. **75**: 618 (Nov.) 1950.

2. Kaipainen, W. J.: Relationship of Bacteria to Streptomycin, Ann. Med. Exper. et biol. Fenniae (supp. 1) **29**: 15, 1951.

3. Gezon, H. M., and Fasan, D. M.: Cross Resistance of Streptococci to Five Streptomyces Antibiotics, Science **114**: 422 (Oct. 19) 1951.

4. Monnier, J. J., and Schoenbach, E. B.: The Resultant Sensitivity of Microorganisms to Various Antibiotics After Induced Resistance to Each of These Agents, Antibiotics & Chemother. **1**: 472 (Oct.) 1951.

5. Gocke, T. M., and Finland, M.: Cross-Resistance to Antibiotics: Effect of Repeated Exposure of Bacteria to Aureomycin, Terramycin, Chloramphenicol or Neomycin on the Resistance to All of These Antibiotics and to Streptomycin and Penicillin, J. Lab. & Clin. Med. **38**: 719 (Nov.) 1951.

exert their action along common pathways. In addition, some evidence has been presented that indicates that cross resistance to antibiotics may develop during therapy,[6] though in such studies it is not easy to rule out superinfection with resistant strains. Should the effects noted in vitro also obtain in vivo, the possibility of developing cross resistance, with subsequent lessening of the efficiency of antibiotic therapy, should be a deterrent to the indiscriminate use of antibiotics, particularly those that readily give rise to resistance.

THE PHYSICIAN'S RESPONSIBILITY

Dr. A. M. Phillips, president of the Medical Association of Georgia, delivered before the annual session of that association an address [1] of importance to every member of the medical profession. Dr. Phillips urged each member of the profession to take inventory of his rights, which in recent years have often been in need of defense, and of his responsibilities to himself, to his patients, to his profession, and to society. He warns that this is an urgent matter. The threatened breakdown, in some areas, of the sympathetic relationship between patient and physician, the insidious encroachment of government in the field of medicine, and the crisis in international affairs demand immediate and serious attention.

The physician's primary obligation, Dr. Phillips points out, is to his patients. To them, time, patience, and undivided attention must be given ungrudgingly—time to explore the diagnostic and therapeutic possibilities thoroughly, patience to explain the general nature of the disorder and its treatment, and attention that arises from a genuine interest in a fellow human being and his problems. Without these things there can be only the assembly line type of practice so greatly deplored elsewhere. In addition, Dr. Phillips points out, we as physicians owe it to our patients "to keep our skill at its peak by practicing in our own expenditure of physical and mental energy, the moderation which we preach to them, and by utilizing the cultural and spiritual resources afforded by wholesome recreation, reading, home life and worship." It is also the physician's duty to his patients to keep abreast of current developments in diagnosis and therapy through regular reading of medical journals and participation in postgraduate educational programs.

Closely related are a physician's responsibilities to his colleagues. To them and to his patients he has an obligation to contribute to medical knowledge. The complacent practice of "cook book" medicine is not enough. In every practice there is the opportunity to make and record careful observations from which significant conclusions can be drawn. Many of the important advances in medicine have been made by busy practitioners. Another duty of physicians, clearly recognized since the time of Hippocrates, is that of interesting themselves in the education of each new generation of doctors, and of maintaining and improving the standards of both premedical and medical education. The profession must make sure that its schools train more than competent technicians. The physician of today must be able to think logically and intelligently in many fields and should have the broadened sympathies that come with an appreciation of music, art, and literature. Particularly is it important that medical schools be kept free from political control, with its potentiality for lowering educational standards and restricting freedom of scientific investigation.

To accomplish these things, members must work together in their medical societies. Only by active participation of all members, however, can these societies be kept democratic. There is no excuse for the allegation that the official policy of these organizations is dictated by a few. The county and state societies and the American Medical Association are governed by elected officials who are subject to the will of the majority. If this will is not made known, the majority has only itself to blame. Once policy is determined, it is the duty of the members to interpret it to patients. Unless they understand medicine's viewpoint, they cannot be expected to sympathize with it, and without such good will medicine cannot be practiced as effectively as it should be. To patients, each physician really is the medical profession, and the most valuable public relations man in the profession is the individual doctor whose genuine affection for, and service to, his patients make of them loyal allies and supporters. Finally, Dr. Phillips points to the current international crisis and the urgent national problems, which threaten the democratic way of life and demand that each physician fulfill his obligations as a citizen. It is his duty to be informed on current issues, to decide what he believes to be right, and to fight for his beliefs. As Dr. Phillips states, "The luxury of neutrality . . . is no longer possible even for physicians."

IMPROBABILITY OF EXTRANEURAL POLIOMYELITIS

The successful cultivation of poliomyelitis virus in suspensions of cells from various tissues or organs, such as skin, muscle, intestine, kidney, or testis, has been taken as proof that the virus is not necessarily neurocytotropic in the intact animal body. This conclusion is challenged by Faber [1] of Stanford University, based on technical errors in the in vitro cultivation technique.

The cells have always been repeatedly washed in saline solution, so that all normal inhibiting serum components are removed and so that many intracellular inhibiting factors are removed or denatured. The added nutrient medium has always been ox serum ultrafiltrate, which is free from normal inhibiting colloids.

There is abundant evidence that neurocytotropism and axonal conduction of the virus takes place in the intact animal. Clinical evidence does not support the belief that other tissues are capable of supporting the virus, since dermatitis, enteritis, nephritis, and orchitis are not clinical features of the disease. All of Faber's attempts to prove multiplication of the virus in the intestinal mucosa of monkeys have led to negative results. He concludes that the theory of extraneural affinities remains without factual proof and only serves to cloud the pathogenesis of the disease.

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6. Kaipainen.[2] Bergersen, F.: A Cross-Reaction in Resistance to Antibiotics, Nature **167**: 995 (June 16) 1951.

1. Phillips, A. M.: The Physician's Responsibility, J. M. A. Georgia **40**: 157 (April) 1951.

1. Faber, H. K.: The Question of Extraneural Growth *in vivo* of Poliomyelitis Virus, Science **114**: 570 (Nov. 30) 1951.

ORGANIZATION SECTION

COMMITTEE ON LEGISLATION

At its meeting in Los Angeles on Dec. 4, 1951, the Committee on Legislation of the American Medical Association recommended approval or disapproval of 21 different legislative proposals. All of the recommendations of the Committee were accepted by the Board of Trustees on Dec. 6, 1951. Following is a brief résumé of the measures proposed by the 82nd Congress and considered by the Committee, with the position of the Association in each instance.

C. JOSEPH STETLER, *Secretary*
Committee on Legislation

S. 1848

Introduced by Senator Frear of Delaware and referred to the Senate Committee on Banking and Currency.

Digest of Bill.—The bill would provide federal indemnity to institutions and individuals suffering property loss or personal injury as a result of enemy attack. The proposal would provide, among other things: (*a*) rehabilitation of community facilities and industrial activities (including hospital, medical schools, clinics, and other health facilities), and (*b*) federal medical care for civilians in attacked areas.

Association Position.—The Association opposes this bill because of (1) lack of agreement between federal agencies as to the purpose and mechanism of the measure, (2) lack of any urgency for legislation at this time to implement the type of program proposed by the bill, and (3) the huge cost of the program and the fact that its enactment would necessitate the establishment of one or more new federal agencies.

S. 1874

Introduced by Senator Murray of Montana and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would charge the Public Health Service with responsibility for (*a*) disseminating pertinent facts concerning leprosy; (*b*) advising and cooperating with other government and private agencies in this field; (*c*) studying and investigating conditions, problems and needs in this field; and (*d*) providing treatment in existing federal and state facilities or in new facilities or paying for necessary private medical care.

Programs would be authorized for research, rehabilitation, and reemployment of leprosy patients, for financial assistance to patients and their dependents, and for compensation for disability.

Association Position.—The Association opposes this bill because of the lack of a demonstrated need for federal legislation in this field.

S. 1875

Introduced by Senator Humphrey of Minnesota and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would authorize federal assistance to voluntary, nonprofit associations to secure facilities and equipment through long-term interest bearing loans for the purpose of operating health insurance plans. The Surgeon General of the United States Public Health Service would formulate standards for the making of loans, the determining of eligibility of organizations, the amount of loans, amortization, and determining priority for making loans.

Association Position.—The Association opposes this bill because the legislation would federalize certain functions that can and should be planned for and operated on a local level.

S. 2171

Introduced by Senator Hill of Alabama and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would provide federal aid for prepayment plans for hospital and medical care for the purpose of furnishing such benefits to persons unable to pay premiums and would provide federal funds to pay for a state survey of (*a*) needs for necessary diagnostic facilities; (*b*) mental, tuberculosis, and chronic disease facilities; (*c*) the shortage of physicians, and (*d*) extent of enrollment in voluntary prepayment health insurance plans.

Association Position.—The Association opposes this bill for the same reason as indicated under S. 1875, above.

S. 2246

Introduced by Senator Lehman of New York and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would amend the Public Health Service Act to enable the Surgeon General to provide monetary grants to states and other local political subdivisions to establish and maintain additional public health services for the detection, treatment, and study of chronic diseases.

Association Position.—The Association opposes this bill because (1) its provisions can, in a large measure, be carried on by existing facilities and (2) no provision is made in the legislation for determining the financial status of the patient.

S. 2247

Introduced by Senator Lehman of New York and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would amend the Public Health Service Act to enable the Surgeon General to provide monetary grants to states and other local political subdivisions to maintain outpatient services in hospitals and health centers for the detection and treatment of disease. The bill would also subsidize home care service and community planning for the ambulatory sick as well as for demonstrations and the training of personnel.

Association Position.—The Association opposes this bill because in effect it authorizes the practice of medicine by hospitals. The Committee did, however, refer the bill to the Council on Medical Service for further study and report.

S. 2248

Introduced by Senator Lehman of New York and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would authorize the Surgeon General to make secured loans for the purchase, construction, remodeling, maintenance, and operation of clinics or other facilities for diagnostic or diagnostic and curative services.

Loans would be made to (*a*) groups of physicians or physicians and dentists licensed under state laws and (*b*) medical schools, teaching hospitals, or other nonprofit public or private organizations.

Association Position.—The Association opposes this bill because the conditions under which loans would be made would unduly hamper the rendering of medical service and the freedom of the individual physician as to types of treatment, fees, etc. The bill would also condone the corporate practice of medicine.

S. 2301

Introduced by Senator Ives of New York (and seven other senators) and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would amend various existing laws for the stated purpose of providing federal assistance for nursing education. The bill would authorize the Public Health Service to administer four new types of benefits: (*a*) annual payments for the cost of nursing instruction, (*b*) grants for constructing and equipping new nursing schools, (*c*) nursing scholarships, and (*d*) federal subsidization of special projects and recruitment

in the field of nursing. The bill also provides for grants to states to assist in the establishment and maintenance of plans for practical nurse training.

Association Position.—The Association opposes this bill because it would authorize federal intervention in the field of education and would permit continuing federal support for a program that is a local responsibility. In addition, the bill would place unwarranted administrative authority in the Federal Security Agency.

S. 2325

Introduced by Senator Humphrey of Minnesota and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would create, within the Department of Labor, a Bureau of Accident Prevention, for the purpose of (*a*) conducting inquiries and investigations into conditions of employment in interstate and foreign industry, (*b*) developing standards of operation and measures for the protection and general well-being of employees, and (*c*) promoting the acceptance of standards developed by the bureau, by employers, and employees.

The bill would also create an Accident Prevention Board for each industry, authorized to promulgate rules and regulations for the elimination of unsafe and unhealthful conditions after conducting public hearings in accordance with the Administrative Procedure Act.

Association Position.—The Association opposes this bill because (1) the need is not demonstrated and (2) the problem can be solved at the state level.

S. 2337

Introduced by Senator Lehman of New York and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would establish two types of programs: (1) an emergency maternal and infant care program for wives and children under 5 years of age of enlisted personnel of the armed forces, and (2) a program of hospital care for any dependent of enlisted personnel of the armed forces. These programs would be financed by the federal government and the states on a 50-50 basis.

Association Position.—The Association opposes this bill because of a report by the Council on Medical Service that the Council in its surveys has not found any evidence of a widespread need that would warrant the creation of a federal program and has agreed, therefore, that with proper planning the persons that do need assistance can be cared for by local agencies without federal intervention.

H. R. 4405

Introduced by Representative Clemente of New York and referred to the House of Representatives Ways and Means Committee.

Digest of Bill.—The bill would authorize the deduction of medical and dental expenses from gross income for income tax purposes. The term "medical expenses" is defined by the bill to include "amounts paid for the diagnosis, cure, mitigation, treatment or prevention of diseases or for the purpose of affecting any structure or function of the body (including amounts paid for accident or health insurance)." Such medical expenses incurred by the taxpayer, his spouse, or his dependents would be deductible.

Association Position.—The Association approves the bill because it would afford individual relief in cases of extremely high medical expenses and would also be an incentive to buy voluntary insurance.

H. R. 4519

Introduced by Representative Baring of Nevada and referred to the House of Representatives District of Columbia Committee.

Digest of Bill.—The bill would make unlawful any experimentation or operation in the District of Columbia on any living dog or cat for any purposes other than healing, curing, or sterilizing. The bill provides a fine or imprisonment or both for violations.

Association Position.—The Association opposes the bill because if enacted it would hamper proper medical research.

H. R. 4549 (identical bills: H. R. 4569, H. R. 4577, and H. R. 4579)

Introduced by Representative Clemente of New York and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bills.—The bills would authorize the Federal Security Administrator to remodel the Ellis Island Marine Hospital at Ellis Island, N. Y., to treat juvenile drug addicts under the supervision of the Surgeon General of the Public Health Service.

Any person under 21 years of age known to use any narcotic drug or derivative thereof without medical supervision or direction would be eligible for admission on application by himself or his parents or upon recommendation of state or city correctional officers.

Association Position.—The Association opposes the bills because it is believed that problems presented by the juvenile drug addict are, for the most part, confined to the large metropolitan areas and should be taken care of, wherever possible, on a local basis. The Committee felt that if necessary the existing facilities (Ft. Worth, Texas, and Lexington, Ky.) should be utilized and if found inadequate they should be expanded.

H. R. 4723

Introduced by Representative Donohue of Massachusetts and referred to the House of Representatives Committee on Veterans Affairs.

Digest of Bill.—The bill would establish a rebuttable presumption of a service-connected disability for persons serving during World War II for psychoses developing a 10% or more degree of disability within five years after separation from active service.

Association Position.—The Association opposes the bill because it represents another effort to further liberalize existing Veterans Administration regulations regarding the presumption of service connection.

H. R. 4912

Introduced by Representative Perkins of Kentucky and referred to the House of Representatives Committee on Education and Labor.

Digest of Bill.—The bill would establish the Federal Agency for Handicapped, to provide various types of rehabilitative services to persons physically or mentally handicapped.

The agency would absorb the functions of the Office of Vocational Rehabilitation; the Division of the Physically Handicapped in the Bureau of Labor Statistics; the functions of the Library of Congress in furnishing aid for the blind; and the functions of the Federal Security Agency with respect to the Vocational Rehabilitation Act and state grants for aid to the blind. The new agency also would coordinate all other rehabilitative measures for the benefit of handicapped persons, administered by other agencies of the government.

Association Position.—The bill was referred to the Joint Committee of the Council on Industrial Health and the Council on Physical Medicine and Rehabilitation for study and report. However, if hearings are scheduled before a report is received H. R. 4912 will be opposed because it would: (1) create a department for a small segment of the field of medicine which would be taken care of if a Department of Health was created; (2) result in overlapping of services, and (3) mean an unnecessary expenditure of funds.

H. R. 5197 (identical Bill: H. R. 5200)

Introduced by Representative Corbett of Pennsylvania and referred to the House of Representatives Committee on Veterans Affairs.

Digest of Bills.—The bills would establish a rebuttable presumption of service connection for poliomyelitis developing a 10% or more degree of disability within five years after separation from active service by World War II veterans who were prisoners of war.

Association Position.—The Association opposes the bill for the reason indicated under H. R. 4723, above.

H. R. 5414 (identical bill: H. R. 5795)

Introduced by Representative Tollefson of Washington and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bills.—The bills would authorize the establishment of a Multiple Sclerosis Institute in the Public Health Service and would authorize and charge the Surgeon General with responsibility for extensive research, investigation, experiments, and dissemination of information regarding multiple sclerosis. This work would be carried on through the use of federal funds in such forms as grants-in-aid, fellowships, and scholarships.

Association Position.—The Association opposes the bills because there are already existing agencies under the direction of the Surgeon General of the United States Public Health Service which could carry on such a program.

H. R. 5426

Introduced by Representative Brooks of Louisiana and referred to the House of Representatives Committee on Armed Services.

Digest of Bill.—The bill would create three major divisions of the reserve components, the ready reserve, the standby reserve, and the retired reserve. Actually, all three are available in case of a national emergency declared by Congress, but the classifications will clarify the exact status of reservists.

In addition to clarifying the status of reservists, the bill would provide for increased and more efficient reserve training.

Association Position.—The Association has no objection to favorable consideration of the bill, since it would clarify the reserve structure of the armed forces and would provide for a more effective reserve training program.

H. R. 5718

Introduced by Representative Roberts of Alabama and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—This bill, which is similar in purpose to H. R. 3298, the drug bill enacted during the first session of the 82d Congress, would (*a*) define prescription drugs by statute, (*b*) permit druggists to fill oral prescriptions for drugs, and (*c*) permit wider latitude in refilling prescriptions for nondangerous drugs.

The bill would, in addition, establish the National Drug Commission, which would be responsible for classifying prescription-only and over-the-counter drugs.

Association Position.—The Association opposes the bill because it would authorize a new federal agency to decide which drugs must be sold only on prescription and which must be labeled for "over-the-counter" sale.

H. R. 5853

Introduced by Representative Priest of Tennessee and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—The bill would authorize federal grants to states on a 50-50 basis to help finance health and safety instruction and physical education for children of school age. It should be noted that the bill is silent as to which federal agency would approve state plans or administer the measure, if adopted. The word "commissioner" is used throughout the bill; however, the term is not defined.

Association Position.—The Association opposes the bill because it (1) deals with a state and local problem, (2) provides for an unnecessary expenditure of funds, and (3) contains many technical errors.

S. J. Res. 110

Introduced by Senator Murray of Montana and referred to the Senate Committee on Labor and Public Welfare.

Digest of Resolution.—The resolution would authorize the Surgeon General of the Public Health Service and the Secretary of the Interior to conduct research, investigation, experiments, and demonstrations into the causes, effects, and means of prevention and control of air pollution. The Surgeon General and the Secretary of the Interior could seek the assistance of other federal, state, and local as well as public and private agencies and bodies concerned with the problem.

Association Position.—The Association approves the resolution because the subject is new and unknown in the field of medicine and research seems to be necessary.

Department of Health

In addition to the above measures, consideration was given to the revised version of S. 1140, 82d Congress, prepared and submitted by the National Doctors Committee for Improved Federal Medical Services, after discussion with a committee of the Board of Trustees in June, 1951. The Committee on Legislation felt that, while several of the changes suggested by the Association had been made, the revised bill still does not meet the main objections raised, i. e., the inclusion of military and Veterans Administration hospitals in the proposed new Department of Health. The Committee, therefore, voted to recommend opposition to the revised version of S. 1140.

Barbiturates

The possibility of new legislation designed to provide federal control of barbiturates by classifying them as narcotics and subjecting them to federal regulations was discussed. The Committee voted to oppose any new legislation designed to establish federal control of barbiturates. It was felt that additional federal control of drugs was unnecessary and that problems existing in that field should be handled by the profession and the states.

STATEMENT OF A. M. A. REPRESENTATIVE BEFORE HOUSE COMMITTEE ON U. M. T.

Mr. Chairman and members of the Committee: My name is Dr. F. J. L. Blasingame. I am engaged in the active practice of medicine in Wharton, Texas, and am a member of the Board of Trustees of the American Medical Association. I am appearing here today, with my colleagues, on behalf of that Association, regarding H. R. 5904, 82d Congress, and the report of the National Security Training Commission.

At the outset, let me say that our purpose in appearing before the committee is to make certain suggestions relative to the medical aspects of universal military training rather than to comment on whether such a program should be adopted. If the Congress, in its discretion, determines that a universal military training program is necessary, the American medical profession is ready to cooperate in its implementation to the fullest. We believe, however, that we can make a contribution at this time in connection with the preliminary planning for such a program, inasmuch as the various councils and departments of the Association have been studying, for some time, the factors involved in the most effective utilization of medical manpower in time of national emergency and in connection with a universal military training program.

The Association has on two occasions appeared before the National Security Training Commission and discussed the medical aspects of universal military training. On both occasions, our representatives and our suggestions were most graciously received. It is the belief of the American Medical Association that the commission is deserving of commendation for the extremely fine job that it has done in studying this subject and preparing a report.

Rather than discuss all of the medical questions that arise in connection with a program of this type, I will restrict my comments to the following three items.

CONTINUATION OF PREPROFESSIONAL AND PROFESSIONAL EDUCATION FOR QUALIFIED STUDENTS

It has always been the firm belief of the American Medical Association that, should a universal military training program be adopted, it is imperative that safeguards be included to prevent any disruption in the education of an adequate force of professional personnel. In order to accomplish the basic underlying purpose of Public Law 51, 82d Congress, i. e., to provide an adequate force of well-trained reserves, it is essential that the education of professional personnel be allowed to proceed without any impairment.

In its report to the Congress, dated Oct. 29, 1951, the National Security Training Commission strongly recommended against (*a*) split periods of preliminary training and (*b*) the deferment of professional students from the six month training period. On page 28 of the report, the Commission does, however, discuss the holding in abeyance of the reserve status "of a number of medical, dental and scientific students until the completion of their professional study."

Inasmuch as this was one of the recommendations of the Association, we were pleased to see its favorable acceptance by the commission. However, the proposal was suggested by the commission for study only, and is not included in the legislation that is currently being considered by this committee. With the rejection of split training periods and the deferment of professional students, it would appear that the holding of the reserve obligation in abeyance is the one remaining mechanism for insuring the uninterrupted flow of trained reserves. Therefore, the Association believes that it is imperative that this proposal be incorporated in the legislation under consideration. Such a change could be effected by adding a proviso to Sec. 9 (b) of H. R. 5904.

In this connection, two further points should be considered. The commission's report on page 28 also notes that: "Under such an arrangement, the reserve obligation of seven and one-half years would not begin to run until *graduation from* medical, dental or scientific school" (italics mine). It is believed that this recommendation should be changed to refer to completion of professional education rather than graduation from medical school. Such a revision would encompass the completion of internship and, in some instances, residency training. Such an amendment would appear to be in line with the thinking of the commission, in view of the following statement, which appears in the same paragraph as the above quoted statement: "it would also provide the armed forces with reservists who were qualified doctors, dentists and technicians, instead of mere apprentices in these fields."

In the implementation of this recommendation, it is essential that no undue advantage accrue to armed forces hospitals by allowing internship and residency service in such installations to count in the total reserve obligation. If this were permitted, the obtaining of interns and residents by civilian hospitals would be made increasingly difficult.

The American Medical Association sincerely believes that a person eligible for induction into the National Security Training Corps, whose aptitude or previous accomplishments indicate that he can best contribute to the nation as a trained professional man, should be placed in a category that will permit him to continue his education and that such a person be so classified before or at the time he reaches the age of induction. It is also believed that the selection of students and the control of educational programs should remain in the hands of the individual colleges and universities.

THE PERFORMANCE OF PREINDUCTION, INDUCTION, AND PERIODIC RESERVE PHYSICAL EXAMINATIONS

Neither Public Law 51, 82d Congress, nor the report of the commission specifies who will perform the induction and preinduction examinations for National Security Training Corps inductees or the periodic physical examinations while they are members of the reserves. If an attempt is made to perform these examinations by using full-time medical personnel of the armed forces, it will be necessary to call into service a much larger number of physicians than is currently required.

It is the belief of the American Medical Association that the use of additional physicians in the armed forces for this purpose is undesirable and unnecessary. It is recommended instead that such examinations be conducted by civilian physicians on a fee basis or by reserve personnel, for the purpose of maintaining a satisfactory reserve status. This system is now operating successfully with respect to the conducting of periodic physical examinations for reservists in the armed forces.

SOURCE AND SELECTION OF MEDICAL AND ALLIED PROFESSIONAL PERSONNEL

The third point I would like to mention deals with the proper agency to determine the medical and allied personnel necessary to man a universal military training program and the extent of the need.

There is considerable concern in the medical profession as to the manner of selecting such personnel and the proper agency to determine the extent of the need.

The American Medical Association is in favor of vesting the authority for making such decisions in a national civilian board or a comparable agency in order to insure the proper distribution of medical and other health reserves between civilian and military needs. Unless this is done, it will be extremely difficult to insure that persons will serve in a manner that will contribute the most to the strength of the nation.

There are two other extremely important medical aspects of universal military training to which I would like to allude. One deals with the medical treatment to be afforded members of the National Security Training Corps and the second with the eligibility of members of the corps for veterans' medical benefits.

With respect to the first, let me say that the American Medical Association thoroughly supports the concept that those persons who cannot meet the physical and mental requirements established for induction into the National Security Training Corps should, when possible, be rehabilitated, but it equally strongly opposes the idea that this responsibility belongs to the federal government.

The original version of S. 1, which eventually became Public Law 51, 82d Congress, contained a section providing for the assumption of corrective treatment and rehabilitative care by the federal government. The American Medical Association feels that the deletion of this section by the Congress, prior to the enactment of S. 1 into law, is indicative of Congressional intent in this regard. In our conversations with the National Security Training Commission, it is apparent that they are also in agreement with us on this point.

The treatment of injuries and sickness arising during, or as a direct result of, military service while in the National Security Training Corps will, of course, be a responsibility of the government. It is believed, however, that in light of the extremely short period of service and the favorable conditions that will prevail (i. e., no overseas assignments and no combat duty) the number of physicians per 1,000 inductees should not exceed the existing requirements for the civilian population generally. Further, it is believed that whatever additional medical personnel is required should be obtained without enlarging the regular complement of the medical corps of the three services. With respect to the reserve personnel that will be recalled in this connection, it is recommended that a rotation system be adopted, with short terms of active duty required.

The American Medical Association is in agreement with the recommendation of the National Security Training Commission concerning the status of trainees with respect to veterans' medical benefits.

It is our belief that the commission deserves particular praise for its constructive comments with respect to the undesirability of adopting the present framework of veterans' legislation as a means of dealing with disabilities and deaths among such trainees. The use of Veterans Administration installations for such purposes would create a need for additional facilities and increased medical staffs, therefore adding to the growing strain on the health and medical manpower resources of the nation created by the existing emergency.

In conclusion, I would like to express the appreciation of the American Medical Association for this opportunity to appear before your committee and present our views on this extremely important subject. If the Association can furnish any additional information or be of assistance in any other way be assured of our willingness to cooperate.

THE PHYSICIAN'S FEDERAL INCOME TAX

Federal income taxpayers on a calendar year basis must on or before March 15 do two things: 1. They must file their final returns for the year 1951. 2. They must file a declaration of estimated tax for 1952.

Copies of appropriate forms have already been distributed to prior taxpayers, together with a small booklet which presents the general requirements of the law. Physicians who are for the first time subject to the requirements of the federal income tax law may obtain the necessary forms from the office of the Collector of Internal Revenue having jurisdiction.

GROSS INCOME

A physician's gross income is the total amount of money received by him during the year for professional services, regardless of the time when the services were rendered for which the money was paid, assuming that the return is on a cash receipts and disbursements basis, plus such money as he has received from investments and from other sources.

If a physician receives a salary as compensation for services rendered and in addition thereto living quarters or meals, the value to the physician of the quarters and meals so furnished ordinarily constitutes income subject to tax. If, however, living quarters or meals are furnished for the convenience of the employer, the value thereof need not be computed and added to the compensation otherwise received by the physician unless such quarters and meals are furnished as a part of compensation.

DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The taxpayer should make no claim for the deduction of expenses unless he is prepared to prove the expenditure by competent evidence. As far as practicable, accurate itemized records should be kept of expenses and substantiating evidence should be carefully preserved. The following statement shows what such deductible expenses are and how they are to be computed:

Office Rent.—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in such dwelling house or apartment, he may not, however, deduct any part of the rent of such house or apartment as professional expense; to entitle him to such a deduction he must have an office there, with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

Office Maintenance.—Expenditures for office maintenance, as for heating, lighting, telephone service, and the services of attendants, are deductible.

Supplies.—Payments for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using; for instance, dressings, clinical thermometers, drugs, and chemicals. Professional journals may be classified as supplies and the subscription price deducted. Amounts currently expended for books, furniture, and professional instruments and equipment, "the useful life of which is short," generally less than one year, may be deducted, but if such articles have a more or less permanent value, their purchase price is a capital expenditure and is not deductible.

Equipment.—Equipment comprises property of a more or less permanent nature. It may ultimately wear out, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using."

The cost of equipment such as has been described, for professional use, cannot be deducted as expense in the year acquired. Examples of this class of property are automobiles, office furniture, medical, surgical, and laboratory equipment of more or less permanent nature, and instruments and appliances constituting a part of the physician's professional outfit, to be used over a considerable period of time, generally over one year. Books of more or less permanent nature are regarded as equipment, and the purchase price is therefore not deductible.

Although the cost of such equipment is not deductible in the year acquired, nevertheless it may be recovered through depreciation deductions taken year by year over its useful life, as described later.

No hard and fast rule can be laid down as to what part of the cost of equipment is deductible each year as depreciation. The amount depends to some extent on the nature of the property and on the extent and character of its use. The length of its useful life should be the primary consideration. The most that can be done is to suggest certain average or normal rates of depreciation for each of several classes of articles and to leave to the taxpayer the modification of the suggested rates as the circumstances of his particular case may dictate. As fair, normal, or average rates of depreciation, the following percentages have been suggested: automobiles, 25% a year; ordinary medical libraries, x-ray equipment, physical therapy equipment, electrical sterilizers, surgical instruments, and diagnostic apparatus, 10% a year; office furniture, 5% a year.

The principle governing the determination of all rates of depreciation is that the total amount claimed by the taxpayer as depreciation during the life of the article, plus the salvage value of the article at the end of its useful life, shall not be greater than its purchase price. The physician must in good faith use his best judgment and claim only such allowance for depreciation as the facts justify. The estimate of useful life, on which the rate of depreciation is based, should be carefully considered in each case.

Dues.—Dues paid to societies of a strictly professional nature are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are generally held to constitute personal expenses and as such are not deductible. If, however, membership in social organizations, such as a country club, is maintained both for personal and professional or business purposes and if evidence can be produced to substantiate the claim that a part of the expenses of such membership was incurred for business purposes, then it would seem that these latter expenses would be deductible. Further discussion of this particular aspect of the federal law will be found in a subsequent paragraph dealing with the deductibility of entertainment expenses.

Postgraduate Study.—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

Traveling Expenses.—Traveling expenses, including amounts paid for transportation, meals, and lodging, necessarily incurred in professional visits to patients and in attending medical meetings for a professional purpose, are deductible.

Entertainment Expenses.—The deductibility of entertainment expenses, when incurred for business purposes, has been upheld, as applied to an actor, in the case of *Blakmer v. Commissioner*, 70 F. (2d) 255. In the case of *Jacobson*, 6 T.C. 1048, the taxpayer was allowed a deduction of expenses incurred for entertaining clients and employees of his law firm. The deductibility of such expenses by an attorney came before the U. S. Tax Court in the case of *Clyde A. Armstrong v. Commissioner*, decided Aug. 29, 1947, 6 TCM 997. In a memorandum opinion rendered by Judge Opper, this was said:

> Taxpayer, a Pittsburgh attorney, became a member of the University Club and the Duquesne Club in order to have available facilities for the entertainment of his clients; his purpose in joining the clubs was not particularly to make contacts productive of new business. In 1942, 1943 and 1944 the Commissioner disallowed deductions representing club dues, but allowed 50 per cent of the house bills incurred by taxpayer at each of the clubs during those years. The court finds that taxpayer used the club facilities not less than 50 per cent of the time for entertaining clients and other purposes incident to the practice of his profession, and allows the deduction of dues to that extent.

In the December 1948 issue of the *Medical Annals of the District of Columbia*, page 697, there was published correspondence that had passed between the secretary of the Medical Society of the District of Columbia and the Internal Revenue Agent in the Baltimore Division, Treasury Department, in which the latter

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Prepared by the Bureau of Legal Medicine and Legislation, American Medical Association.

stated that if entertainment expenses incurred by a physician have a direct relation to the production of income, and can be supported by the taxpayer, they will be taken into consideration in determining his net taxable income.

Collectors of Internal Revenue in several jurisdictions have questioned the right of physicians to deduct entertainment expenses, contending that it is unethical for a physician to make expenditures of this character. The Judicial Council of the Association, in its report to the House of Delegates at the Los Angeles, 1951, meeting said in part:

"The Council does not consider such expenditures as *per se* unethical. There are circumstances under which a professional obligation may rest on a physician to entertain other physicians. It is a usual and necessary concomitant of the practice of medicine. It is certainly not an uncommon practice and is recognized by the profession generally as entirely proper and justifiable." This report was approved by the House of Delegates (*J. A. M. A.* **147:**1686, Dec. 22, 1951).

Automobiles.—Payment for an automobile is a payment for permanent equipment and is not deductible. The cost of operation and repair, and loss through depreciation, are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance, repairs, garage rental (when the garage is not owned by the physician), chauffeur's wages, and the like.

Deductible loss through depreciation of an automobile is the actual diminution in value resulting from obsolescence and use and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is possessed by the present taxpayer.

If an automobile is used for professional and also for personal purposes—as when used by the physician partly for recreation, or so used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice and using his car merely to go to and from his office cannot deduct depreciation or operating expenses; he is regarded as using his car for his personal convenience and not as a means of gaining a livelihood. What has been said in respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

Surgical Uniforms.—Amounts expended by surgeons for the purchase and maintenance of distinctive types of uniforms which are not adaptable to ordinary wear and which are required to be worn while on duty are deductible as ordinary and necessary business expenses.

MISCELLANEOUS

Contributions to Charitable Organizations.—For detailed information with respect to the deductibility of charitable contributions generally, physicians should consult the official return blank or obtain information from the collectors of internal revenue or from other reliable sources. An individual taxpayer can deduct such contributions only to the extent that they do not exceed 15% of his adjusted gross income. The physician may not deduct as a charitable contribution the value of services rendered an organization operated for charitable purposes.

Bad Debts.—Physicians who make their returns on a cash receipts and disbursements basis, as most physicians do, cannot claim deductions for bad debts.

Taxes.—Taxes generally, either federal or state, are deductible by the person on whom they are imposed by law. Both real and personal property taxes are deductible; but so-called taxes, more properly assessments, paid for local benefits, such as street, sidewalk, and other like improvements, imposed because of and measured by some benefit inuring directly to the property against which the assessment is levied, do not constitute an allowable deduction from gross income. Physicians may deduct state gasoline taxes and state sales taxes. In some states sales taxes are imposed on the seller, but if they are passed on to the buyer the latter may deduct them.

State income and use taxes are deductible; federal income taxes are not. Federal import, excise, or stamp taxes are deductible only to the extent that they are attributable to business activities. State automobile license fees are deductible. If a state or local fee is imposed for regulatory purposes, and not to raise revenue, the fee may not ordinarily be deducted as a tax. If such fees, however, are classifiable as a business expense they are deductible as such. Annual registration fees imposed on physicians probably come within the category of regulatory fees and should be deducted as a business expense rather than as taxes. Local and state occupational taxes imposed on physicians are deductible either as taxes or as a business expense, depending on the purpose for which the tax is imposed.

The excise taxes imposed on employers by section 804, title VIII, and section 901, title IX, of the Social Security Act, commonly referred to as old age and unemployment benefit taxes, are deductible annually by employers in computing net income for federal income tax purposes. If the taxpayer's return is made on a cash basis, as are the returns of practically all physicians, the taxes are deductible for the year in which they are actually paid. If the return is made on an accrual basis, the taxes are deductible for the year in which they accrue, irrespective of when they are actually paid. Employees, including physicians whose employment brings them within that category, may not deduct the tax imposed on them by section 801, title VIII, of the Social Security Act, generally referred to as the old age benefits tax. If, however, the employer assumes payment of the employee's tax and does not withhold the amount of the tax from the employee's wages, the amount of the tax so assumed may be deducted by the employer, not as a tax paid but as an ordinary business expense.

Medical Expense.—A taxpayer may deduct amounts in excess of 5% of adjusted gross income expended for medical, dental and hospital expense for himself, his spouse or a dependent, not compensated for by insurance or otherwise, including amounts paid for health and accident insurance, according to a prescribed formula. Effective for years beginning after 1950, this 5% limitation does not apply with respect to medical expenses for the care of the taxpayer or his spouse if either has reached the age of 65 before the close of the year. The law limits the deduction to a maximum of (*a*) $1,250 if the taxpayer claims only one exemption; (*b*) $2,500 if the taxpayer is a single person or if married and filing a separate return and claims more than one exemption; (*c*) $2,500 if the taxpayers are married and file a joint return and claim two exemptions, $3,750 if three exemptions are claimed and $5,000 if four or more exemptions are claimed.

Laboratory Expenses.—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

Losses by Fire or Other Causes.—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent to which it has not been made good by repair and the cost of repair claimed as a deduction.

Insurance Premiums.—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes, and against loss from theft of professional equipment and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

Expense in Defending Malpractice Suits.—Expense incurred in the defense of a suit for malpractice is deductible as a business expense.

Sale of Spectacles.—Oculists who furnish spectacles, etc., should enter as income money received from such sales and deduct as an expense the cost of the article sold.

FEDERAL MEDICAL LEGISLATION

Universal Military Training

Senator Russell of Georgia introduced S. 2441, on his own behalf and for eight other Senators, to provide for the administration and discipline of the National Security Training Corps. It differs from the bill introduced in the House by Representative Vinson (H. R. 5904), the Armed Services Committee chairman, in two major respects: 1. Section 8 of this bill provides that the Department of Defense, after preparing the annual budget for the training corps, shall submit budget estimates to the National Security Training Commission for approval. The Vinson bill gives the commission advisory authority only; therefore, the Russell bill provides greater civilian control over the budget. 2. The Russell bill contains a section not found in the Vinson bill wherein any trainee, after finishing the six months period of training, who volunteers for, and satisfactorily completes, a term of enlistment in certain organized units of the armed forces will be released from further service and training. Further, any trainee who, after completing six months of training, volunteers and accepts service in certain reserve components would be released from further training and service after three years, unless Congress authorizes his reinduction at a later date. This bill is identical with H. R. 5903, previously reported.

Another UMT bill, H. R. 6032, was introduced by Representative Brooks of Louisiana. It also would provide for the administration and discipline of the National Security Training Corps. This bill is identical with S. 2441, described above.

Social Security Amendments

Representative Ford of Michigan introduced H. R. 6078, proposing to amend the Social Security Act to permit federal participation in public assistance for patients in private institutions for tuberculosis and for patients in private institutions for mental diseases. At present, the several states conducting public assistance programs (for the elderly, blind, and totally and permanently disabled) partially supported by the federal government, may not use federal funds to make money payments to, or for medical care in behalf of, recipients of such public assistance programs who are patients in private or public institutions. This bill would remove the prohibition in the case of recipients who are inmates of private institutions while retaining the prohibition for such payments to or in behalf of such recipients in public institutions.

Veterans Presumption of Service Connection

S. 2465 was introduced by Senator Johnson of Colorado. It would liberalize the basis for establishing wartime service connection for active tuberculosis, psychoses, and multiple sclerosis. It is identical with H. R. 5892, which would create a presumption of service connection if any of the three mentioned diseases developed within three years after discharge.

Cancer Research

Senator Neely of West Virginia introduced S. 2409, proposing to authorize and request the President to undertake to mobilize in some convenient place in the United States an adequate number of the world's outstanding experts and coordinate and utilize their services in a supreme endeavor to discover means of curing and preventing cancer. This bill is identical with H. R. 556 and with other bills in previous Congresses.

STATE MEDICAL LEGISLATION

Georgia

Bills Introduced.—H.R. 194, proposes to authorize an investigation of the possibility of requiring **third and fourth year medical students** to spend at least two months interning at the Milledgeville State Hospital. H. 659 and S. 247, propose amendments to the uniform narcotic act relating to the sale of **narcotics and harmful and habit forming barbiturates** to a minor. H. 760, proposes amendments to the uniform narcotic act relating to the illegal sale of **narcotics** to minors. S. 291, to amend the premarital examination law, proposes to authorize **osteopaths** to sign the necessary certificates.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

New York

Bills Introduced.—A.R. 36, proposes the creation of a joint legislative committee to study the question of **mental retardation of children** with a view toward prevention and better ways of amelioration of the conditions arising out of mental retardation. A. 3 and S. 3, propose to direct the mental health commission to formulate a program for the development and maintenance of one or more clinics for the diagnosis, treatment, and rehabilitation of **chronic alcoholics.** A. 45, proposes an appropriation for the maintenance of **school milk and school lunch programs.** A. 74, to amend the **state income tax law,** proposes that any taxpayer shall be entitled to deduct 100% of the expenses paid for **medical care** for each dependent who has reached the 65th birthday. A. 140, proposes the creation of an **adult hygiene and geriatrics** division in the department of health. A. 142, proposes to authorize the comptroller to enter into contracts for furnishing **medical and surgical services** and hospital services to officers and employees in the state civil service. A. 264, A. 500, S. 373 and S. 518, to amend the public health law, propose to prohibit the sale of **hypodermic syringes or needles** except upon the prescription of duly licensed physicians or veterinarians, unless the sale is to such persons as physicians, nurses, pharmacists, hospitals, or the like. A. 270, to amend the public health law, proposes regulations for the compulsory, health, treatment, guidance, and rehabilitation of **adolescent drug users.** A. 301 and S. 237, propose the enactment of a comprehensive statewide system of **health insurance.** A. 339, proposes that the **sale of ready-made reading spectacles** for reading glasses as merchandise by persons who do not assume directly or indirectly to adapt them to the eye, and where the selection of the spectacles is at the discretion of the purchaser, shall not be covered by the law relating to the sale of eyeglasses. A. 432, to amend the law relating to **physiotherapy,** proposes that applicants for a license must show that they have completed two years of a four-year course of study in a college or university maintaining a standard satisfactory to the department which included courses of at least six semester hours each in English, physics, biology, or zoology, and general chemistry and at least three semester hours in organic chemistry. A. 441 and S. 252, to amend the judiciary law, propose to exempt **chiropodists** from jury duty. A. 544, to amend the labor law, proposes that in every industry, trade, or occupation where 50 or more persons are employed, the labor board shall require the establishment of a **first-aid station** under the guidance of a competent person whose sole duty shall be providing aid for injuries received during employment. A. 603 and S. 464, to amend the civil practice act, propose to include **chiropodists** with physicians, dentists, and nurses, so far as the disclosure of professional information is concerned. A. 686, to amend the education law, proposes to authorize **physiotherapists** to use the roentgen ray or x-ray if they have had at least a two year course in radiographic technic at a college or university approved by the state education department. A. 863, proposes to authorize the state commissioner of health to designate approved laboratories or institutions wherein properly conducted **scientific tests or experiments** or investigations involving the use of live animals may be performed or conducted. The proposal would authorize the state commissioner of health to prescribe the rules under which such approval would be granted. A. 868, to amend the workmen's compensation law, proposes to authorize the board to designate **physicians especially qualified** with respect to the diagnosis or treatment of a disability to examine claimants. S. 3, proposes that the mental health commission formulate a program for the development and maintenance of one or more clinics in the state, operated by public or private nonprofit community agencies, for the **diagnosis, treatment, and rehabilitation of chronic alcoholics.** S. 71, to amend the civil service law, proposes to authorize the state to enter into contracts of the furnishing of **medical and surgical services** and hospital services to employees. S. 110, to amend the public health law relating to the powers and duties of the commissioner in relation to **cancer control,** proposes to direct the commissioner to conduct periodical investigations of new developments in the study of cancer and to file the reports of such findings. S. 111, proposes to require the commissioner of health to make available to any qualified member of the medical profession, upon request, the records relating to the care and treatment of **cancer** patients at the Roswell Park Memorial Institute. S. 112, to amend the public health law, proposes to direct the state commissioner of health to establish an agency to provide public instruction by means of motion pictures, lectures, for the **care, treatment, diagnosis, and control of cancer.** S. 169, to amend the education law, proposes regulations relating to a **subsidy for student nurses.** S. 225, to amend the workmen's compensation law, proposes that **resident physicians, resident interns, and assistant resident interns** in prisons, reformitories, insane asylums, and hospitals maintained by a municipal corporation shall be employees within the meaning of the state workmen's compensation act. S. 249, to amend the law relating to **physical therapy,** proposes to define a physical therapist as one who treats or offers to treat any human pain, injury, deformity, or physical condition by the use of actinotherapy; hydrotherapy, which shall include under hydrotherapy, electric baths of all types, medicated baths of all types, and the giving of colonic irrigations; mechanotherapy, which shall include all types of therapeutic exercise and massage; thermotherapy and electrotherapy, exclusive of the x-ray. S. 252, to amend the judiciary law, proposes that **pediatrists** shall be exempt from jury duty. S. 254, proposes additional regulations relating to preprofessional training of applicants for a license to practice **physiotherapy.** S. 272, proposes to prohibit the sale of **hypodermic syringes and hypodermic needles** except upon the prescription of a duly licensed physician or veterinarian. S. 277, to amend the public health law, proposes to provide for the compulsory care, treatment, guidance, and rehabilitation of adolescent drug users. S. 385, proposes that any hotel, club, camp, or other resort having sleeping accommodations for 300 or more persons should at all times have a **resident physician** in attendance. S. 403, to amend the penal law, proposes to make it unlawful for any person to sell at retail or give away any **antihistamine drug,** or any other preparation containing antihistamines, without obtaining a prescription of a duly licensed practitioner of medicine.

MEDICAL NEWS

CALIFORNIA

Typhus Outbreak in Altadena.—A localized outbreak of endemic typhus fever has occurred in Altadena in Los Angeles County, in an area where no previous cases had been reported, according to the California State Department of Public Health. On December 15 two cases had been confirmed by laboratory tests, and tests on another dozen suspected cases were being run at the state virus laboratory in Berkeley. The outbreak is believed to have been associated with the demolition of a rat-infested barn. A state mobile laboratory was dispatched to the area so that on-the-spot examination could be made of fleas on household pets and trapped rats.

Lectures on Legal Medicine.—The schools of law and medicine on the Los Angeles campus of the University of California and university extension will cooperate with the Junior Bar of the State Bar Association of California to present lectures on orientation in legal medicine from 7 to 9 p. m. on seven Mondays beginning February 11 at the California Teachers Association Building, 612 South Figueroa St. The conferences will present distinguished local attorneys and medical men as speakers. Applications for enrollment may be obtained from the Department of Conferences, University Extension, University of California, Los Angeles 24. Enrollment fee, including a copy of proceedings, is $12.50.

Postgraduate Assembly in Los Angeles.—The Postgraduate Assembly and Convention, sponsored by the Alumni Association of the College of Medical Evangelists School of Medicine, Los Angeles, will be held March 2-4 at the Biltmore Hotel in Los Angeles. Among the 37 speakers will be Maj. Gen. George Armstrong, Washington, D. C.; Drs. Lester R. Dragstedt and Walter C. Alvarez, Chicago; Drs. Sara M. Jordan, Martin L. Tracey, and John W. Norcross, Boston; Dr. George Lull, Chicago, Secretary and General Manager of the American Medical Association; Dr. Priscilla White, Boston; Dr. Harold G. Wolff, New York, and Dr. Giles A. Koelsche, Rochester, Minn. Short courses in therapeutics, internal medicine, pediatrics, roentgenology, dermatology, psychiatry, surgery, otolaryngology, urology, proctology, anesthesiology, and obstetrics and gynecology are to be given on March 5-7. Members of the faculties of Western medical schools will serve on the faculty for these sessions. For information address Evelyn R. Strachan, Managing Director, 312 North Boyle Ave., Los Angeles 33.

Tropic Diseases Research Project. — The newly-established Pacific Tropic Diseases Research Project will have its headquarters in the department of infectious diseases at the University of California School of Medicine at Los Angeles. It will be directed by Dr. John F. Kessel. William A. Robinson, Tahiti, author of "Ten Thousand Leagues Over the Sea," is assisting in establishing the project.

Immediate objectives of the program according to Dr. Stafford L. Warren, dean of the medical school, are (1) to continue the investigation of filariasis, (2) to study the recent outbreak of poliomyelitis in Tahiti, and (3) to study other tropical diseases such as leprosy and yaws. The long-range objectives of the project are to provide a center for teaching and research on tropical diseases on the Los Angeles campus and continuation of field studies in the Pacific Ocean area. The advisory committee of the Pacific Tropic Diseases Research Project will consist of Dr. Charles M. Carpenter, professor of infectious diseases at the university; Willard H. Wright, Ph.D., director, division of tropical diseases, National Institutes of Health, Bethesda, Md., and Dr. Henri Galliard, professor of parasitology, University of Paris, as well as Cornelius Crane, Chicago, and Mr. Robinson. Dr. Kessel is now in Tahiti, organizing the field staff. The Pacific Tropic Diseases Research Project will work in cooperation with the U. S. Public Health Service and the French Colonial Medical Service. Dr. Kessel spent four years with the Rockefeller Foundation at the Peking Union Medical College from 1923 to 1927, and from 1927 to 1929 he was associate professor of parasitology in the department of zoology at U. C. L. A.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

CONNECTICUT

Appointments in Psychiatry.—The department of psychiatry and mental hygiene of Yale University, New Haven, has announced the appointment of Dr. Francis J. Braceland, psychiatrist-in-chief of the Institute of Living, as clinical professor of psychiatry. Dr. Jules V. Coleman, New Haven, and Dr. William L. Pious, New Haven, have been appointed associate clinical professors of psychiatry, and Dr. Else Pappenheim, who has been associated with Yale University since 1948, has been promoted to assistant clinical professor of psychiatry.

Yale Opens Marriage Counseling Clinic.—One of the first marriage counseling clinics to be conducted under the auspices of a university medical school will open this spring at Yale University, sponsored jointly by the departments of psychiatry and of obstetrics and gynecology. The clinic is being established to satisfy a demand on the part of physicians, clergymen, social workers, and others. It will provide premarital counseling, although most of the work is expected to be with married persons. The Yale clinic will serve couples in the New Haven area and will work in cooperation with other agencies that want to refer cases. In certain cases the clinic will work in conjunction with the infertility clinic of Yale. A grant from the Planned Parenthood League of Connecticut has already been received to help in starting the counseling service.

DISTRICT OF COLUMBIA

Personal.—The American Board of Obstetrics and Gynecology has announced the election of Dr. John L. Parks, Washington, D. C., as a director of the board. Dr. Parks succeeds Dr. Joseph L. Baer, Chicago, who has been vice-president of the board for over 20 years and who has resigned.

Health Department Appointment.—The appointment of Dr. Frederick C. Heath to replace Dr. Arthur E. Cliff as assistant director of public health, District of Columbia Health Department, was announced January 10. Dr. Heath is resigning his present position as health officer, Fairfax County, Va., to accept this new assignment.

GEORGIA

Meeting of Ophthalmologists and Otolaryngologists.—The Georgia Society of Ophthalmology and Otolaryngology will hold its annual meeting March 7-8 at the General Oglethorpe Hotel on Wilmington Island, Savannah. Guest speakers and their subjects are as follows:

Murray F. McCaslin, Pittsburgh, Selection of Anesthesia in Ophthalmology.
J. Conrad Gemeroy, Detroit, External Diseases of the Eye; Management of Metallic Intraocular Foreign Bodies.
Joseph S. Haas, Chicago, Differential Diagnosis of the Primary Glaucomas; Provocative Tests in Glaucoma.
Henry B. Orton, Newark, Applied Surgery of the Neck.
Albert P. Seltzer, Philadelphia, Plastic Surgery of the Nose.
John R. Lindsay, Chicago, Vertigo: Differential Diagnosis and Treatment; Secretory Otitis Media.

The registration fee is $20.

ILLINOIS

Society News.—A meeting of the Illinois Chapter of the American College of Chest Physicians will be held jointly with the Chicago Roentgen Society on February 14 at the University Club, Chicago. The program will be devoted to a discussion of the superior vena cava syndrome.

Lectures on Psychiatry.—The first in a series of thirteen seminars in modern concepts in psychiatry was given at the Veterans Administration Hospital, Downey, and at the Mental Hygiene Clinic, 366 W. Adams St., Chicago, January 16. Melville J. Herskovits, Ph.D., Evanston, editor of the *American Anthropologist*, gave three lectures on January 16, the first and second being held at Downey Hospital at 10 a. m. and 1 p. m., and the third at the Mental Hygiene Clinic at 8 p. m. Dr. Herskovits is chairman of the committee on international relations in anthropology of the National Research Council. Speakers at the remaining sessions are as follows: Drs. Clara Thompson, St. Louis; Helen V. McLean, Chicago; James G. Miller, Chicago; Norman Haire, London, England; Harry C. Solomon, Boston; Paul H. Hoch, New York; Harold E. Himwich, Galesburg, Ill.; Ladislas J. Meduna, Chicago; R. Burke Suitt, Durham, N. C.; Karl M. Bowman, San Francisco; David McK. Rioch, Rockville, Md., and Henry A. Davidson, Newark, N. J. All members of the medical and allied professions are invited.

Chicago

Lewis Linn McArthur Lecture.—Dr. Russell S. Fisher, associate professor of legal medicine at the University of Maryland, will deliver the 28th Lewis Linn McArthur Lecture of the Frank Billings Foundation of the Institute of Medicine at the Palmer House February 22 at 8 p. m. His subject will be "The Changing Perspective in Medicolegal Practice."

Department of Preventive Medicine Becomes a Division.—The department of preventive medicine at the University of Illinois College of Medicine has been made the division of preventive medicine in the department of medicine in action taken by the university's board of trustees. The merger was recommended by a committee of the faculty.

Grant for Hematology Research.—The Olivia Sue Dvore Foundation presented $5,000 January 16 to Dr. Steven O. Schwartz, a director of the Hektoen Institute for Medical Research of the Cook County Hospital, for studies on leukemia and other blood diseases. A total of $22,000 has been donated by the foundation since it was organized three years ago.

New Heart Association Seals for Fund Drive.—Sheets of seals portraying 27 outstanding figures in medical history are being used this year by the Chicago Heart Association in its campaign for funds of $600,000. The seals are to be mailed to residents of Chicago during February, National Heart Month. A stamp album containing information about each of the medical leaders, from Hypocrates to Herrick, is to accompany the seals. It also carries two pages depicting the year around work of the heart association.

Appointments at Northwestern.—Three new appointments and six promotions in the faculty of the Northwestern University Medical School have been announced. Dr. Benjamin Boshes, associate professor of nervous and mental diseases, has been promoted to professor and named acting chairman of the department. Dr. George M. Landau, formerly associate professor of roentgenology at Loyola University, has been appointed assistant professor of radiology, and Dr. Lee G. Sewall, Roanoke, Va., associate professor of nervous and mental diseases. Other promotions include: Dr. Fred W. Merrifield, from assistant to associate professor of surgery; Reinhold Benesch, Ph.D., from instructor to assistant professor of biochemistry; Dr. Nathan N. Crohn, from associate in surgery to assistant professor in surgery; Dr. Paul B. Szanto, from associate in pathology to assistant professor of pathology, and Dr. George C. Turner, from instructor to associate in medicine.

INDIANA

Clinic on Reconstruction of the Nose.—Dr. Mauriçe H. Cottle, Chicago, will conduct a clinic on the restoration of nasal function by the surgical reconstruction of the nose on February 12-14 at the Indiana University Medical Center, Indianapolis.

The Burton D. Myers Lecture.—Dr. Charles A. Doan, dean of the Ohio State University College of Medicine, Columbus, will deliver the third annual Burton D. Myers Lecture at the Indiana University School of Medicine, Indianapolis, the evening of February 29. All physicians are invited. The local chapter of Nu Sigma Nu fraternity established the lecture series in 1950 as a tribute to the late Dr. Myers, an alumnus and emeritus professor of anatomy. A dinner for chapter members and alumni will precede the lecture.

Personals.—Dr. Charles W. Myers, superintendent of Indianapolis General Hospital for 20 years, retired on January 16. He was succeeded by Dr. Gerald F. Kempf, Indianapolis, who has been city health director since 1946.——Dr. Robert K. S. Lim, head of the department of physiology and pharmacology at Creighton University Medical School in Omaha, has been appointed head of the section of physiology and pharmacology of the Miles-Ames Research Laboratory in Elkhart.——Dr. S. Milton Rabson, laboratory director, St. Joseph Hospital, Fort Wayne, has been elected a corresponding member of the British Association of Forensic Pathologists.

KENTUCKY

University Appointment.—Dr. U. Pentti Kokko has been appointed associate professor in child health research at the University of Louisville School of Medicine. He will continue studies in poliomyelitis in the school's Kentucky Child Health Foundation Laboratory, which is under the direction of Dr. Alex J. Steigman, professor of child health.

LOUISIANA

Dr. Rudolph Matas Honored.—An honorary fellowship in the American College of Surgeons was presented in January to Dr. Rudolph Matas, emeritus professor of surgery at Tulane University, at special ceremonies in New Orleans. The fellowship was conferred by Dr. Alton Ochsner, president of the college and professor of surgery at Tulane, who succeeded Dr. Matas as chairman of the department in 1927. Dr. Matas was one of the original founders of the college in 1913, serving as its president in 1925-26 and as its vice-president in 1913 and 1921. Dr. Matas graduated from the Tulane medical school in 1880.

MICHIGAN

Personals.—On November 13 Dr. William C. Behen of Lansing and Dr. Paul G. Hanna of St. Joseph were appointed to the Michigan State Board of Registration in Medicine. Dr. Joseph P. Bertucci of Ishpeming has also been appointed to the board.

Public Health Directors Meeting.—At the invitation of the state health commissioner, Dr. Albert E. Heutis, the health directors of Michigan's 51 local full time health departments, met in Lansing for a three day conference beginning February 6 to outline a course of action for the health programs in the state. Four main topics were taken up in committee discussions:

Administration, Vladimir K. Volk, director, Saginaw County Health Department, chairman.
Environmental and Industrial Health, Eldred K. Musson, deputy director, Wayne County Health Department, chairman.
Disease Control and Laboratories, Winston B. Prothro, director, Kalamazoo City-County Health Department, chairman.
Child Health, Vergil N. Slee, director, Barry County Health Department.

This is the third year the state health commissioner has called on the local health directors for specific recommendations for the improvement of state and local health department programs. The previous conferences resulted in 97 recommendations, practically all of which have been put into effect, Dr. Heustis states.

MINNESOTA

Dr. Howard Succeeds Dr. Aagaard.—Dr. Robert B. Howard has been named director of continuation medical education at the University of Minnesota, Minneapolis, succeeding Dr. George N. Aagaard, who took over his new duties in January as dean of the Southwestern Medical School at Dallas, Texas.

Grant for Research in Tuberculosis.—The Minnesota Public Health Association has established the H. Longstreet Taylor grant of $7,500 to be made annually to the University of Minnesota for tuberculosis research. The fund is named for the late

Dr. Taylor, who was active in the state campaign for the prevention of tuberculosis. Dr. J. Arthur Myers, professor of preventive medicine and public health at the university, is administering the grant.

NEVADA

Narcotic Violation.—Dr. William C. Harper, Las Vegas, was convicted of violation of the federal narcotic law at Las Vegas on May 28, 1951, and was sentenced to a term of eight years in the United States penitentiary to be selected by the Attorney General.

NEW HAMPSHIRE

State Code of Cooperation.—The New Hampshire Medical Society's code of cooperation with hospitals, the press, and radio, adopted at its annual meeting in September, has subsequently been adopted by all component county societies. The state society has received requests from the national wire services and most of the state medical societies for copies of the code. Recently the Pennsylvania State Medical Society adopted a similar code and used that of New Hampshire as a basis.

NEW YORK

Rename Brooklyn Cancer Institute.—The Brooklyn Cancer Institute, a unit of Kings County Hospital Medical Center in Brooklyn, was renamed January 10 the John E. Jennings Hospital in memory of Dr. Jennings, leader in the establishment of the institute and its first director. Dr. Jennings died May 25, 1945. Acting director of the hospital is Dr. Asa B. Friedmann.

Hospital Affiliates with Georgetown University.—St. Mary's Hospital of Rochester has affiliated with Georgetown University School of Medicine, Washington, D. C., to augment its teaching facilities. Full time staff members from Georgetown will visit St. Mary's in Rochester monthly for periods of four or five days, and interns and residents will be rotated for brief periods through the Georgetown center. The plan also provides for short visits of St. Mary's attending staff to the Georgetown center for special instruction and observation. This new venture in the field of postgraduate education is under the direction of Dr. Harold J. Jeghers, professor of medicine at Georgetown University.

Birth Registration Test.—The State Department of Health reported January 14 that a federal and state birth registration test made in conjunction with the 1950 census showed 99.8% of all babies born in upstate New York and 99.2% of the babies born in New York City had their births registered. The 99.5% registration for the entire state compares with a 97.8% figure for the entire nation. The 1950 birth registration test is the second nationwide check of registration completeness in the United States, and was conducted as a cooperative project by the Bureau of the Census, the National Office of Vital Statistics, and state and territorial offices of vital statistics. The first such check, made in 1940, showed 98.9% registration completeness for the state as a whole. On a nationwide basis 92.5% of all newborn babies had their births registered in that year.

Postgraduate Education.—Two postgraduate lectures have been arranged for the Elmira Chapter of the Academy of General Practice to be given at the Mark Twain Hotel in Elmira at 6:30 p. m. as follows:

February 13, Office Gynecology, Clyde L. Randall, Buffalo.
April 9, Diagnosis and Treatment of Common Neurological Disorders, Paul H. Garvey, Rochester.

The third in a series of postgraduate lectures will be delivered by Dr. Gilbert M. Beck, professor of psychiatry at the University of Buffalo School of Medicine, on February 14 at 4 p. m. at a meeting of the Saratoga County Medical Society at the New Worden Hotel in Saratoga Springs. His subject will be "Psychiatric Problems in General Practice." Dr. Paul Reznikoff, professor of clinical medicine at Columbia University Medical College, New York, will speak on "Diagnosis and Treatment of Anemia" at a meeting of the Dutchess County Medical Society March 12 at 8:30 p. m. at Hudson River State Hospital in Poughkeepsie. This instruction is provided by the Medical Society of the State of New York in cooperation with the New York State Department of Health.

New York City

Annual Welch Lecture.—Dr. Gilbert Dalldorf, director of the Division of Laboratories and Research of the New York State Department of Health, will deliver the annual William Henry Welch Lecture of the Mount Sinai Hospital of New York in Blumenthal Auditorium February 13 at 8:30 p. m. His subject will be "From Clostridium Welchii to the Coxsacki Viruses: Changing Microbiology."

Appoint Director of Institute of Administrative Medicine.—Dr. E. Dwight Barnett, director of Harper Hospital in Detroit since 1946, has been appointed first director of Columbia University's Institute of Administrative Medicine (THE JOURNAL, Dec. 15, 1951, page 1585). Dr. Barnett is a former director of school health in Santa Rosa, Calif., and a past director of health and hospitals in Sonoma, Calif.

State's First Licensed Physician is Still in Practice.—Dr. Leopold Stieglitz, 84, who holds the state board of regent's medical license No. 1, began his 61st year of practice January 25. Dr. Stieglitz passed the board's first examination with a combined mark, in five subjects, of 499 out of 500. He took his examination after receiving his medical degree, *summa cum laude*, at Heidelberg, Germany, in 1891. He still maintains a general practice in his modest office at 1040 Park Ave.

Symposium on Rheumatic Fever.—The New York Society of Circulatory Diseases will hold its third regular meeting at 8:30 p. m. February 26 in room 440 of the New York Academy of Medicine building. Guest speakers at this session, devoted to a symposium on rheumatic fever, will include:

Gene H. Stollerman, medical director, Irvington House, Clinical Features and Prophylaxis in Children.
Charles K. Friedberg, associate physician, Mount Sinai Hospital, Clinical Features and Differential Diagnosis in the Adult.
Joseph J. Bunim, New York University College of Medicine, Modern Treatment.

The meeting is open to all members of the medical profession.

Change Date of Course in Exfoliative Cytology.—The date for this course to be given at Cornell University Medical College, as originally announced in THE JOURNAL, Dec. 8, 1951, page 1477, has been changed to March 10-June 6. This course in cytologic interpretation is open to a limited number. It will cover the cytology of the gastrointestinal, respiratory, urinary, and female genital tracts, as well as exudates. Instruction in laboratory procedures related to cytology will be given. Arrangements for shorter periods of instruction covering certain principles of exfoliative cytology may be made for physicians who are unable to take the entire three month course. Tuition is $300 or proportionate fees for shorter periods. Instruction is under the direction of Dr. George N. Papanicolaou and Dr. John F. Seybolt.

Personals.—Dr. George T. Pack recently visited South America and at the invitation of national surgical societies and universities delivered addresses in Chile, Peru, and Argentina.——Dr. Theodore E. Allen has been appointed associate medical director of the Arabian American Oil Company.——Dr. J. Lewis Amster, honorary consulting surgeon of Morrisania City Hospital and creator of the Amster Library there, was recently selected as one of the two recipients of the Outstanding Bronx Citizen's Award of 1951.——Richard J. Block, Ph.D., has been appointed director of the new biochemical laboratories of the special products division of the Borden Company. He will retain his position as a lecturer at New York Medical College, Flower and Fifth Avenue Hospitals.——Dr. Louis L. Amato has been appointed medical director of the Frances Schervier Home and Hospital.

TEXAS

Gift for Cardiovascular Research.—The family of Mr. H. H. Weinert of Seguin, a former regent of the University of Texas, has made a donation of $2,500 to the University of Texas Medical Branch, Galveston, to support cardiovascular research under the direction of Dr. George Herrmann, professor of medicine.

Society News.—At the annual meeting of the Texas Academy of Internal Medicine at Galveston in January, Dr. W. Clay Dine Jr. of Amarillo was elected president.——The fourth annual meeting of the Texas Rheumatism Association was held January 18 in Galveston under the presidency of Dr. George W. N. Eggers of the University of Texas Medical Branch, Galveston. A feature of the meeting was a symposium on rheumatic fever in adults and children. Dr. Edward F. Rosenberg, chairman of the arthritis clinics of the Michael Reese and Mt. Sinai hospitals in Chicago, was guest speaker. Dr. Howard C. Coggeshall, clinical associate professor of medicine in Southwestern Medical School of the University of Texas, Dallas, was elected president for the coming year.

VIRGINIA

University Appointment.—Dr. Edward V. Jones, former instructor in psychiatry at the University of Michigan, Ann Arbor, has been appointed assistant professor of neurology and psychiatry at the University of Virginia, Charlottesville. Dr. Jones will be responsible for the direction of the laboratories of encephalography.

WEST VIRGINIA

Visiting Committee for Medical School.—President Irvin Stewart has appointed the first visiting committee for West Virginia University's School of Medicine, designating Dr. William R. Laird of Montgomery as chairman for the first 18 months of his term that expires June 30, 1954. Other members are Dr. Newman H. Dyer, Charleston, state health director; Dr. Delivan A. MacGregor, Wheeling; Dr. Albert U. Tieche, Beckley, and Dr. Walter E. Vest, Huntington. This is the sixth visiting committee functioning at the university. Their purpose is to bring the teaching and research activities into closer contact with the life of the state. Meetings are held at intervals at the call of the chairmen.

Personals.—Dr. Isaac C. East, Oxford, Miss., has been named superintendent of Spencer (W. Va.) State Hospital to succeed Dr. Robert T. Stenberg, resigned. Dr. East has been clinical director of the Eastern State Hospital at Williamsburg, Va., since 1947, and, in addition, has directed the Lower Peninsula Mental Hygiene Clinic at Newport News.——Dr. William H. Guthrie, Red Jacket, was scheduled to leave late in January to serve a three year term as physician and surgeon for the Presbyterian Board of Foreign Missions in French Cameroun, West Africa. This will be the second three year term served by Dr. Guthrie in that area. His address, effective February 1, will be Central Hospital, Mission Protestante Americaine, Ebolowa, French Cameroun, West Africa.

WISCONSIN

Personal.—Dr. Pierce D. Nelson, Madison district health officer since 1949, has become director of the tuberculosis and heart disease control divisions of the state board of health.

Research on Leukemia.—The Milwaukee Division of the American Cancer Society has awarded a $25,000 grant to Marquette University School of Medicine, Milwaukee, for research on leukemia. Dr. Anthony V. Pisciotta, who presently is in Boston as assistant to Dr. William Dameshek, has been chosen to head the project. He will devote full time to the program beginning July 1, working directly with leukemia patients at Milwaukee County General Hospital.

Dr. Swindle to Retire as Department Director.—Dr. Percy F. Swindle, professor and director of the department of physiology at Marquette University School of Medicine, Milwaukee, since 1922, is retiring from his administrative duties to devote more time to research as an active member of the department. Dr. James J. Smith, former dean of the Stritch School of Medicine of Loyola University, Chicago, and presently chief of the education division of the department of medicine and surgery at the Veterans Administration Central Office, has been named to succeed Dr. Swindle. He will join the faculty in March.

GENERAL

Society Elections.—At the annual meeting of the American Academy of Occupational Medicine January 17-18 the following officers were among those elected for 1952: Dr. James H. Sterner, Rochester, N. Y., president; Dr. Allan J. Fleming, Wilmington, Del., vice-president; Dr. Arthur F. Mangelsdorff, New York, treasurer, and Dr. Leonard J. Goldwater, New York, secretary. ——Delegates to the International Congress on Mental Health that met in Mexico City December 11-19 elected the following officers: Dr. Alfonso Millan, Mexico, D. F., president, and Dr. George S. Stevenson, New York, treasurer.

U. S. P. Conference on Hyaluronidase.—An open conference will be held at 10 a. m. February 15 at the Pharmacopeia Building, 46 Park Avenue, New York, on the pharmaceutical aspects of hyaluronidase. The conference will take up various problems concerned with the assay of hyaluronidase and with the standards for strength, quality, and purity to appear in U. S. P. XV, as well as the preparation of a U. S. P. Reference Standard. Interested parties are invited. To make adequate preparations for the conference, the U. S. P. office, 46 Park Ave., New York 16, will appreciate being informed as to the number planning to attend.

Mexican Border Public Health Meeting.—The tenth annual meeting of the United States-Mexico Border Public Health Association will be held in Monterrey, Nuevo Leon, Mexico, on March 17-20. Dr. Wilton L. Halverson of San Francisco is the president and Dr. Salvador Molina Velez of Monterrey, president-elect. This year's program will include symposiums on poliomyelitis and industrial hygiene. Public health problems of particular interest to the border area will be discussed in section meetings on tuberculosis, public health nursing, maternal and child health, sanitation, preventive medicine, and veterinary public health.

Electroencephalography Meeting.—The Western Society of Electroencephalography will meet at the Del Monte Lodge in Pebble Beach, Calif., March 2-3 under the presidency of Dr. Henry W. Newman, San Francisco. With the exception of one by Dr. John R. Green of Phoenix, all scientific papers will be presented by California physicians. The subjects include "The Electroencephalograph in Acute Alcoholic Intoxication," "Changes in the Electrical Activity of the Hypothalamus Induced by Stress Stimuli," "Electroencephalography in the Parents of Epileptics," "An Electroencephalographic Study of Stuttering," and "Electroencephalographic Findings on 21 Cases of Sexual Psychopaths." The banquet will be held at 7:30 p. m. March 2.

Teachers Conference in Clinical Radiology.—The annual Conference of Teachers of Clinical Radiology will meet February 9 at the Palmer House in Chicago. The morning panel discussion will deal with the teaching of radiation therapy to the radiological resident. Dr. Earl E. Barth, Chicago, will serve as moderator, and the subject will be introduced by Drs. Charles L. Martin, Dallas; Hugh F. Hare, Boston, and Earl R. Miller, San Francisco. Dr. W. Edward Chamberlain, Philadelphia, will serve as moderator at an afternoon discussion of "What the Preceptor Should Teach His Young Colleague or Resident About Ethics and Administration." The annual presidential address will be given following the luncheon by Dr. Robert R. Newell, San Francisco, president of the American College of Radiology.

International Union Against Tuberculosis.—The 12th conference of this group is to be held in Rio de Janeiro, Brazil, August 24-27. Papers to be presented include the following:

J. Burns Amberson, New York, Treatment and Prognosis in Minimal Pulmonary Tuberculosis.
Arvid Wallgren, Sweden, Immunity and Tuberculosis.
Fernando Gomez, Uruguay, Organization and Results in Regard to the Tuberculosis Campaign of Mass Surveys.

Prof. Manoel de Abreu of Rio de Janiero, president of the union, will preside at the conference, the first since the Copenhagen conference in 1950. Prof. Etienne Bernard of Paris is secretary-general. The scientific sessions will be preceded by meetings of the union's executive committee and council. Representatives on the council from the United States include Dr. James E. Perkins, New York, managing director, and Dr. Esmond R. Long, director of medical research, National Tuber-

culosis Association; Dr. Gilberto S. Pesquera of New York City; Dr. Herbert L. Mantz of Kansas City, Mo., and Dr. David T. Smith of Durham, N. C. Frederick D. Hopkins, Ph.B., former executive secretary of the National Tuberculosis Association, will also attend the conference.

Awards in Medical Journalism.—The Albert and Mary Lasker Foundation has announced the third annual Lasker Awards for Medical Journalism. All newspapermen and magazine writers who have written medical or health articles during 1951 are eligible to compete. The deadline for entries is March 15. The awards consist of $500 each and a statuette of the Winged Victory of Samothrace, symbolizing in this instance victory over death and disease. They will be presented to the newspaper and magazine writers who have written the best articles, series of articles, editorials, or columns dealing with improvement of public health or prolongation of life through medical research or public health programs. The Nieman Foundation for Journalism at Harvard University will administer the awards. The foundation seeks especially to foster journalism that contributed to a better public understanding of medical research and health programs relating to the diseases that are major causes of death or disability, especially heart diseases, cancer, mental illnesses, arthritis, blindness, and neurological diseases. Entries may be made either by individual writers, editors, or by readers of newspapers and magazines. As many entries as desired may be made, provided articles have been published in a newspaper or magazine dated during the calendar year 1951. Entries should be forwarded to the Nieman Foundation for Journalism, 44 Holyoke House, Cambridge 38, Mass., not later than March 15. The awards will be presented at the annual dinner meeting of the National Association of Science Writers in Chicago, June 10.

FOREIGN

Large Meningitis Epidemic in Africa.—According to the *New York Times*, the World Health Organization has reported an epidemic of cerebrospinal meningitis in regions south of the African desert belt. In the Anglo-Egyptian Sudan there were 51,296 cases with 6,877 deaths during the first half of 1951.

Course in Pediatrics.—The Chair of Pediatrics and Child Care of the University of Santiago de Compostela and the Departmental School of Child Care of Galicia, Spain, is presenting three postgraduate courses for general physicians at the university. The first was held February 11-16 on diagnosis and treatment of the most frequent illnesses of childhood. The second course on tuberculous meningitis will be given March 10-15. The fee for enrollment is 200 pesetas payable before March 1. The third course, entitled "Extension of Pediatrics and Child Care," will be held May 12-24. In addition to Spanish professors, there will be Prof. Fanconi of Zurich, Wallgren of Stockholm, Bamatter of Geneva, Lemoine of Paris, and Guassardo of Turin. Enrolment fee is 750 pesetas. For information address the Clinic of Pediatrics, Courses for Postgraduates, Faculty of Medicine of Santiago de Compostela, Spain.

International Venereal-Disease Control Center.—The first international model center for venereal-disease control among seamen opened in Rotterdam December 21. The center will provide facilities for study and demonstration of recently-developed techniques of venereal disease control, with particular concern for problems of seafarers. Short training courses will be set up for medical officers, nurses, laboratory technicians, and medical social workers from many countries. Study groups will be assigned to investigate various problems of maritime venereal disease control. The World Health Organization will provide the necessary technical personnel, fellowships for training courses, and some materials. The Netherlands will make available the facilities of a special polyclinic in the Rotterdam Maritime Health Center. Rotterdam has been chosen as the site for this first international port demonstration project because it is the largest European port of reception for overseas shipping as well as the terminus for most shipping coming up the Rhine River from as far inland as Basel, Switzerland. The project will also serve as a technical center for the recently organized Rhine River Anti-Venereal-Disease Commission. The new center will be under the general direction of Dr. E. H. Hermans, director of the Maritime Health Center.

MEETINGS

AMERICAN ACADEMY OF ALLERGY, Hotel Sherman, Chicago, Feb. 18-20. Dr. Ben Z. Rappaport, 208 East Wisconsin Ave., Milwaukee 2, Secretary.

AMERICAN ACADEMY OF FORENSIC SCIENCES, Biltmore Hotel, Atlanta, Ga., March 6-8. Prof. Ralph F. Turner, Michigan State College Dept. of Police Administration, East Lansing, Mich., Secretary.

AMERICAN ACADEMY OF GENERAL PRACTICE, Atlantic City, N. J., March 24-27. Mr. Mac F. Cahal, 406 West 34th St., Kansas City 2, Mo., Executive Secretary.

AMERICAN ASSOCIATION OF ANATOMISTS, Providence, R. I., March 19-21. Dr. Normand L. Hoerr. 2109 Adelbert Road, Cleveland 6, Secretary.

AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Drake Hotel, Chicago, April 1-3. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago 37, Secretary.

AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY, Netherlands-Plaza Hotel, Cincinnati, March 31-April 4. Dr. Luella E. Nadelhoffer, 116 South Michigan Ave., Chicago 3, Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, Chicago, March 29-30. Dr. Sydney G. Margolin, 714 Madison Ave., New York 21, New York, Secretary.

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE, Palmer House, Chicago, Feb. 11-12. Dr. Donald G. Anderson, 535 N. Dearborn St., Chicago 10, Secretary.

CENTRAL SURGICAL ASSOCIATION, Toronto, Can., March 6-8. Dr. James T. Priestley, 102 Second Avenue S.W., Rochester, Minn., Secretary.

CHICAGO MEDICAL SOCIETY ANNUAL CLINICAL CONFERENCE, Palmer House, Chicago, March 4-7. Dr. Walter C. Bornemeier, 86 East Randolph St., Chicago 1, Secretary.

MICHIGAN CLINICAL INSTITUTE, Book-Cadillac Hotel, Detroit, March 12-14. Dr. H. G. Cummings, 606 Townsend St., Lansing 15, Chairman.

MISSOURI STATE MEDICAL ASSOCIATION, St. Louis, March 30-April 2. Dr. H. E. Petersen, 634 North Grand Blvd., St. Louis 3, Secretary.

NATIONAL CONFERENCE ON MEDICAL SERVICE, Palmer House, Chicago, Feb. 10. Dr. Harlan A. English, 139 North Vermilion St., Danville, Ill., Secretary.

NATIONAL CONFERENCE ON RURAL HEALTH, Shirley-Savoy Hotel, Denver, Feb. 28-Mar. 1. Dr. F. S. Crockett, 535 North Dearborn St., Chicago 10, Chairman.

NEW ORLEANS GRADUATE MEDICAL ASSEMBLY, Municipal Auditorium, New Orleans, March 10-13. Dr. Woodward D. Beacham, 1430 Tulane Ave., Room 105, New Orleans 12, Secretary.

NORTH PACIFIC SOCIETY OF INTERNAL MEDICINE, Portland, Ore., March 22. Dr. R. L. King, 1115 Terry Ave., Seattle 1, Secretary.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:
- Atlantic City, N. J., Chalfonte-Haddon Hall, Feb. 11-12. Dr. David B. Allman, 104 St. Charles Place, Atlantic City, Chairman.
- Quebec, Can., Chateau Frontenac, Feb. 18-19. Dr. Paul A. Poliquin, 71 St. Ann St., Quebec, Can., Chairman.
- Minneapolis, Radisson Hotel, March 24-26. Dr. Harvey Nelson, 78 South 9th St., Minneapolis 2, Chairman.
- Vancouver, B. C., Vancouver Hotel, March 31-April 4. Dr. J. Russell Neilson, 925 West Georgia St., Vancouver, B. C., Chairman.

SOUTHEASTERN ALLERGY ASSOCIATION, Augusta, Ga., March 21-22. Dr. Katharine B. MacInnis, 1515 Bull St., Columbia 49, S. C., Secretary.

SOUTHEASTERN SECTION, AMERICAN UROLOGICAL ASSOCIATION, Boca Raton, Fla., April 2-5. Dr. Russell B. Carson, Sweet Bldg., Fort Lauderdale, Fla., Secretary.

SOUTHEASTERN SURGICAL CONGRESS, Atlanta, Ga., March 10-13. Dr. Benjamin J. Beasley, 701 Hurt Bldg., Atlanta 3, Ga., Secretary.

SOUTHWEST ALLERGY FORUM, Hotel Baker, Dallas, Texas, March 2-4 Dr. James Holman, Medical Arts Bldg., Dallas, Secretary.

TRI-STATES MEDICAL ASSOCIATION OF THE CAROLINAS AND VIRGINIA, Roanoke, Va., Feb. 18-19. Dr. James N. Northington, 306 North Tryon St., Charlotte 2, N. C., Secretary.

UNITED STATES-MEXICO BORDER PUBLIC HEALTH ASSOCIATION, Monterrey, Nuevo Leon, Mexico, March 17-19. Dr. J. C. Ellington, 314 U. S. Court House, El Paso, Texas, Secretary.

WESTERN SOCIETY OF ELECTRO-ENCEPHALOGRAPHY, Del Monte Lodge, Pebble Beach, Calif., March 2-3. Dr. Nicholas A. Bercel, 450 North Bedford Drive, Beverly Hills, Calif., Secretary.

INTERNATIONAL

AUSTRALASIAN MEDICAL CONGRESS, Melbourne Victoria, Australia, Aug. 22-30. Dr. C. H. Dickson, Medical Society Hall, 426 Albert St., East Melbourne, Victoria, Australia, Hon. General Secretary.

COMMONWEALTH AND EMPIRE HEALTH AND TUBERCULOSIS CONFERENCE, Central Hall, London, England, July 8-13. Dr. J. H. Harley Williams, Tavistock House North, Tavistock Sq., London, W.C.1, England, Secretary General.

CONGRESS OF THE INTERNATIONAL DIABETES FEDERATION, Leyden, Netherlands, July 7-12. Dr. F. Gerritzen, 33, Prinsegracht, The Hague, Netherlands, Secretary.

EUROPEAN SOCIETY OF CARDIOVASCULAR SURGERY, Strasbourg, France, Oct. 3-4. Sir James Learmonth, Department of Surgery, University New Buildings, Edinburgh 8, Scotland.

INTERAMERICAN CARDIOLOGICAL CONGRESS, Buenos Aires, Argentina, Aug. 31-Sept. 7. Dr. Blas Moia, Larrea 1132, Buenos Aires, Argentina, Secretary-General.

INTER-AMERICAN CONGRESS OF PUBLIC HEALTH, Havana, Cuba, Sept. 27-Oct. 1. Pan-American Sanitary Bureau, 2001 Connecticut Ave., Washington, D. C.

INTER-AMERICAN CONGRESS OF RADIOLOGY, Mexico City, Mexico, Nov. 2-6. Dr. Guido Torres Martinez, Marsella No. 11, Mexico, D.F., Secretary-General.

INTERNATIONAL COLLEGE OF SURGEONS, Madrid, Spain, May 20-24. Dr. Max Thorek, 850 West Irving Park Road, Chicago, Ill., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF COMPARATIVE PATHOLOGY, Madrid, Spain, May 4-11. Prof. Carda-Aparici, Calle Fernando VI.8, Madrid, Spain, Secretary.

INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILOLOGY, London, England, July 21-26. Dr. Gordon B. Mitchell-Heggs, 5, Lisle St., London, W.C.2, England, General Secretary.

INTERNATIONAL CONGRESS ON DIABETES, Leyden, The Netherlands, July 7-12. Dr. F. Gerritzen, 33, Prinsegracht, The Hague, Netherlands.

INTERNATIONAL CONGRESS OF HAEMATOLOGY, Mar del Plata, Argentina, Sept. 21-26. Dr. Carlos Reussi, Anchorena 1710, Buenos Aires, Argentina, Secretary.

INTERNATIONAL CONGRESS OF HEALTH TECHNICIANS, Palais de la Mutualite, Paris, France, June 9-14. Secretariat General, 6 Square Desaix, Paris XV°, France.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Friends House, London, N.W.1, Eng. Sept. 15-18. Sir Harold Boldero, 12 Pall Mall East, London, S.W.1, England, Secretary.

INTERNATIONAL CONGRESS OF LEGAL AND SOCIAL MEDICINE, Berne, Switzerland, April 15-18. Prof. J. Dettling, 20, Buhlstrasse, Berne, Switzerland.

INTERNATIONAL CONGRESS ON NEUROPATHOLOGY, Rome, Italy, Sept. 8-13. Dr. Armando Ferraro, 722 W. 168th St., New York, N. Y., U. S. A., Secretary General.

INTERNATIONAL CONGRESS OF OTO-NEURO-OPHTHALMOLOGY, Lisbon, Portugal, April 22-26. Prof. Diogo Furtado, Servico de Neurologia, Hospital dos Capuchos, Lisbon, Portugal, General Secretary.

INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Hon. Secretary.

INTERNATIONAL CONGRESS FOR THERMALISM AND CLIMATOTHALASSOTHERAPY, Nice-Cannes, France, April 3-8.

INTERNATIONAL UNION AGAINST TUBERCULOSIS, Rio de Janeiro, Brazil, Aug. 24-27. Prof. Etienne Bernard, 66 Blvd. St. Michel, Paris 6e, France, Secretary-General.

INTERNATIONAL SOCIETY OF GEOGRAPHIC PATHOLOGY, Liège, Belgium, July 15-18. Dr. Fred C. Roulet, Habelstr. 24, Basel, Switzerland, Secretary General.

LATIN AMERICAN CONGRESS OF PHYSICAL MEDICINE, Panama City, R. P., Feb. 24-29. Dr. Cassius Lopez de Victoria, 176 East 71st St., New York, N. Y., U. S. A., Executive Director.

NEURORADIOLOGIC SYMPOSIUM, Stockholm, Sweden, Sept. 17-20. Docent Ake Lindbom, Symposium Neuroradiologicum, Serafimerlasarettet, Stockholm K., Sweden, Secretary.

PAN-AMERICAN CONGRESS OF GASTROENTEROLOGY, Mexico City, D.F., May 11-17. Dr. R. Flores-Lopez, Calle Dr. Balmis, No. 148, Mexico City, D.F., Secretary.

PAN-EUROPEAN CONGRESS OF GASTROENTEROLOGY, Bologna, Florence and Rome, Italy, April 20-26. Prof. Guido Bassi, Policlinic of St. Orsola, Bologna, Italy, Secretary.

WORLD MEDICAL ASSOCIATION, Athens, Greece, Oct. 12-16. Dr. Louis H. Bauer, 2 East 103d St., New York 29, N. Y., Secretary General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 24-26, 1952. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

ALASKA:* *Examination.* Juneau, March 4. Also on application in other towns where there are board members. *Reciprocity.* On application. Sec., Dr. W. M. Whitehead, Box 140, Juneau.

ARIZONA:* *Examination.* Phoenix, April 15-17. *Reciprocity.* Phoenix, April 19. Sec., Dr. J. H. Patterson, 316 W. McDowell St., Phoenix.

ARKANSAS:* *Examination. Regular.* Little Rock, June 5-6. Sec., Dr. Joe Verser, Harrisburg. *Homeopathic.* Little Rock, June 10-11. Sec., Dr. Carl S. Bungart, 105 N. 14th St., Fort Smith. *Eclectic.* Little Rock, June 5-6. Sec., Dr. Frank C. Smith, 2301 Broadway, Little Rock.

CALIFORNIA: *Written.* Los Angeles, Feb. 18-21; San Francisco, June 23-26; Los Angeles, Aug. 18-21; Sacramento, Oct. 20-23. Application must be received at least two weeks prior to date of examination. *Oral for Reciprocity Applicants.* Los Angeles, Feb. 16; San Francisco, June 21; Los Angeles, Aug. 16; San Francisco, Nov. 8. Applicants are requested not to arrange to come to an oral examination until they receive notice from the Credentials Committee. *Oral and Clinical for Foreign Medical School Graduates.* Los Angeles, Feb. 17; San Francisco, June 22; Los Angeles, Aug. 17; San Francisco, Nov. 9. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

COLORADO:* *Examination.* Denver, June 10-12. Final date for filing application is May 12. *Reciprocity.* Denver, April 8. Final date for filing application is Mar. 10. Sec., Dr. Samuel H. Brown, 831 Republic Bldg., Denver.

CONNECTICUT:* *Regular Examination.* Hartford, March 11-12. Sec. to the Board, Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic Examination.* Derby, March 11. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: Dover, July 8-10. Sec., Dr. Joseph S. McDaniel, 229 South State St., Dover.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, March 10. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

FLORIDA:* *Examination.* Jacksonville, June 29-July 1. Sec., Dr. Homer L. Pearson, 701 Dupont Bldg., Miami.

GEORGIA: Atlanta and Augusta, June. Sec., Mr. R. C. Coleman, 111 State Capital, Atlanta 3.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John K. Battenfield, Agana.

IDAHO: Boise, July 14-16. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

ILLIONOS: *Examination.* Chicago, April 1-3, June 24-26 and Oct. 7-9. Supt. of Regis., Mr. Charles F. Kervin, Capitol Bldg., Springfield.

INDIANA: Indianapolis, June 1952. Sec., Dr. Paul R. Tindall, 1138 K of P Bldg., Indianapolis 4.

IOWA:* *Examination.* Iowa City, June 9-11. Sec., Dr. M. A. Royal, 506 Fleming Bldg., Des Moines.

KANSAS: Kansas City, June 4-5. Sec., Dr. O. W. Davidson, 864 New Brotherhood Bldg., Kansas City.

KENTUCKY: *Examination.* Louisville, June 4-6. Sec., Dr. Bruce Underwood, 620 S. Third St., Louisville.

MAINE: Portland, March 11-12. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Examination.* Baltimore, June 17-20. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore.

MICHIGAN:* *Examination.* June. Sec., Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA: Minneapolis, April 15-17. Sec., Dr. Julian F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSOURI: *Examination.* Jefferson City, Feb. 19-21. *Reciprocity.* Jefferson City, Feb. 11. Exec. Sec., Mr. John A. Hailey, Box 4, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 1. Sec., Dr. S. A. Cooney, 214 Power Block, Helena.

NEW HAMPSHIRE: Concord, March 12-13. Sec., Dr. John S. Wheeler, State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 17-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO:* Santa Fe, April 14-15. Sec., Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.

NORTH CAROLINA: *Reciprocity.* Pinehurst, May 5. Sec., Dr. Joseph J. Combs, 716 Professional Bldg., Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, July 9-11. *Reciprocity.* Grand Forks, July 12. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Examination.* Columbus, June 17-20. *Reciprocity.* Columbus, April 1. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

OKLAHOMA:* *Examination.* Oklahoma City, June 4-5. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Reciprocity.* Portland, April 18-19. *Examination.* Portland, July. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

PUERTO RICO: *Examination.* San Juan, March 4. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

RHODE ISLAND:* *Examination.* Providence, April 3-4. Sec., Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Reciprocity.* Columbia, March 3 and April 7. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA:* Rapid City, July 15. Sec., Dr. C. B. McVay, Yankton Clinic, Yankton.

TENNESSEE:* *Examination.* Memphis, March 26-27. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis.

TEXAS: Fort Worth, June 19-21. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth.

UTAH: *Examination.* Salt Lake City, July. Asst. Dir., Mr. Frank E. Lees, 314 State Capitol Bldg., Salt Lake City 1.

VIRGINIA: *Examination.* Richmond, June 12-14. *Reciprocity.* Richmond, June 11. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

VIRGIN ISLANDS: St. Thomas, June 4-5. Sec., Dr. Earle M. Rice, St. Thomas.

WEST VIRGINIA: Charleston, April 7-8. Sec., Dr. H. H. Dyer, State Office Bldg. No. 3, Charleston 5.

WASHINGTON: Seattle, July. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: *Examination.* On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

ARIZONA: Tucson, March 18. Sec., Mr. Herbert D. Rhodes, University of Arizona, Tucson.

COLORADO: Denver, March 5-6. *Examination.* Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

DISTRICT OF COLUMBIA: *Examination.* Washington, April 21-22. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington, D. C.

FLORIDA: Gainesville, June 7. *Examination.* Sec., Mr. M. W. Emmel, Box 340, University of Florida, Gainesville.

OKLAHOMA: *Examination.* Oklahoma, April 14. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON: *Examination.* Portland, March 1, June 7, Sept. 6 and Dec. 6. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 13. *Examination.* Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TENNESSEE: *Examination.* Memphis and Nashville, March 20-21. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

TEXAS: Austin, April. *Examination.* Sec., Bro. Raphael Wilson, 306 Nalle Bldg., Austin.

WISCONSIN: *Examination.* Madison, April 5, and Milwaukee, June 7. Sec., Mr. W. H. Barber, Ripon College, Ripon.

* Basic Science Certificate required.

DEATHS

Edgar Erskine Hume, Major General, MC, U. S. A. (retired), until recently chief surgeon of the Far East Command, died in Walter Reed Hospital, Washington, D. C., January 25, aged 62, of dissecting aneurysm of the abdominal aorta. General Hume was born in Frankfort, Ky., Dec. 26, 1889, graduated from Centre College, Ky., in 1908, and took his medical degree at Johns Hopkins University, Baltimore, in 1913. He studied public health and tropical medicine at Harvard and Massachusetts Institute of Technology, and graduated from the Infantry School in 1924; from the Infantry School Advanced Course in 1932; from the Army Command and General Staff School in 1936, and from the Army War College in 1938. He was certified by the American Boards of Psychiatry and Neurology and Internal Medicine.

General Hume joined the regular Army Medical Corps in 1916, was an honor graduate of the Army Medical School in 1917, then became executive officer of the Division of Sanitation in the Surgeon General's Office. He was soon sent overseas, was later in command of all United States hospitals in Italy, served with the British Expeditionary Forces in 1918, and served on the Western Front during the Meuse-Argonne and Saint Mihiel offensives. After the war he was chief medical officer and head of the American Red Cross staff in Serbia, where he successfully combated a typhus epidemic and received his first Distinguished Service Medal. He directed refugee operations in the Baltic countries. Returning to the United States in 1920, General Hume was assigned to the Army Laboratory for New England in Boston and held various other assignments prior to World War II. He was editor of the *Index Catalog*, Army Medical Library, Washington, D. C., 1922-1926; medical inspector of the Infantry School at Fort Benning, Ga., 1926-1930; inspector for the Massachusetts and New Hampshire National Guards 1930-1932; librarian for the Army Medical Library 1932-1936; director of administration, Medical Field Service School, Carlisle, Pa., 1937-1942, and commanding officer at Winter General Hospital in Topeka, Kan., the following year. Early in World War II he was assigned to the General Staff Corps in North Africa for military government planning of the invasion of Sicily and Italy. He became chief of public health in Sicily and chief of Allied Military Government of the Fifth Army in the Mediterranean theatre, heading successively military governments in Naples, where he halted a typhus epidemic, in Milan, Rome, Florence, and other major Italian cities. He remained in Europe as chief of the Military Government of the U. S. Zone in Austria from 1945-1947 when he became chief of the orientation branch, Department of the Army. In 1948 he was promoted to the rank of brigadier general and to major general in 1949. General Hume went to Tokyo in July, 1949, as chief surgeon of the Far East Command and subsequently was appointed to the additional post of surgeon of the United Nations Command in Korea. He returned to the U. S. last November and retired December 31.

General Hume was one of the most decorated medical officers in United States history. He had been awarded two Distinguished Service Medals, the Silver Star with two clusters, the Legion of Merit, the Soldier's Medal, Army Bronze Stars, a Navy Bronze Star, the Purple Heart, and the Bali Grand Cross of the Sovereign Military Order of Malta. He had received the U. S. Typhus Medal, the Sir Henry Wellcome Prize (1933), the Founder's Medal of the Association of Military Surgeons, 1941, the Aztec Eagle for services and work on military medicine in 1943, and the Gorgas Medal in 1948. He was the Army delegate and national correspondent to the International Congress of Military Medicine in Paris in 1925 and to nine other meetings of the congress. General Hume had degrees and honors from various universities in the United States and in eight foreign countries. He held decorations from 37 countries in Europe and Latin America, was a lecturer in medical history at Georgetown University and the University of Kansas, was an honorary professor of the University of Warsaw, honorary colonel of the Royal Serbian Army, and honorary citizen of 40 Italian and Austrian cities. He was a fellow of the American Academy of Arts and Sciences, the Royal Society of Edinburgh, Royal Society of Tropical Medicine and Hygiene, American College of Surgeons, American College of Physicians, and the American Public Health Association. His memberships in societies included the American Medical Association, Royal Italian Society of Hygiene, Society of Antiquaries of Scotland, academies of science of Spain, Mexico and Philadelphia, and the academies of medicine in Rome and Washington. He was secretary (1923-1924) and president (1947-1948) of the Association of Military Surgeons of the United States. At one time he was editor of *The Military Surgeon* and an associate editor of the *Annals of Medical History*. General Hume was a member of many other clubs and societies in this country and abroad, including the Society of Cincinnati (vice-president-general 1951), Aztec Club, of which he was president, and Delta Omega (founder and national president in 1926). He was the author of many books and papers including the "Medical Book of Merit," "Victories of Army Medicine," and was a contributor to the Encyclopedia Britannica, Encyclopedia Americana, "Tice's Practice of Medicine," and the "Dictionary of American Biography."

Farrell, LeRoy Francis ✙ Captain, U. S. Navy, retired, Santa Monica, Calif.; Tufts College Medical School, Boston, 1925; commissioned a lieutenant (j.g.) in the medical corps of the regular Navy on June 4, 1925, and was assigned to the Naval Hospital, Boston, for his internship; attained the rank of captain on May 15, 1943; served at various Naval hospitals ashore and aboard ships of the fleet and at Asiatic stations; served as executive officer of the Naval Hospital, Aiea Heights, T. H., Corpus Christi, Texas and Quantico, Va.; in 1948 was a staff member of the U. S. Naval Advisory Group, Survey Board, Nanking, China; served at the Naval Hospital and Naval Dispensary, Washington, D. C., from September, 1940, until December, 1941, when he was transferred to the Naval Ammunition Depot, Burns City, Ind.; after prolonged illness was placed on the retired list on Aug. 1, 1950; died November 29, aged 50.

Dockery, Earl Edward ✙ Medical Director, Captain, U. S. Navy, retired, Norfolk, Va.; born at Fond du Lac, Wis., Jan. 24, 1891; Chicago College of Medicine and Surgery, 1917; enrolled in the medical corps of the U. S. Naval Reserve as a lieutenant (j.g.) on March 2, 1918 and was commissioned in the regular Navy Medical Corps in September, 1919; served at various Naval hospitals ashore and aboard ships of the fleet and at the Bureau of Medicine and Surgery, Washington, D. C., from April, 1942, until August, 1943, at which time he was transferred to the Naval Operating Base, Norfolk, Va.; retired Aug. 1, 1945; died in U. S. Naval Hospital, St. Albans, L. I., N. Y., November 26, aged 60, of myocardial infarction.

Adams, Charlie, Cordele, Ga.; Emory University School of Medicine, 1925; member of the American Medical Association; formerly a member of the city commission; past president of the Crisp County Chamber of Commerce; died November 2, aged 51.

Burkhardt, Charles Frederick, Biloxi, Miss.; Kentucky School of Medicine, Louisville, 1893; served during World War I; died in the Veterans Administration Center November 6, aged 83, of cerebral vascular accident.

Butterfield, Clifford Allen ✙ Medford, Mass.; Tufts College Medical School, Boston, 1922; member of the board of health; served during World War I; on the staff of Lawrence Memorial Hospital; died in Lake Saboa, Burlington, Me., November 8, aged 59, in an airplane crash.

Curtis, George Nathaniel ✙ Salt Lake City; Northwestern University Medical School, Chicago, 1913; past president and secretary of the Utah State Medical Association; served as medical director of the Salt Lake County General Hospital; died November 20, aged 70, of coronary occlusion.

✙ Indicates Fellow of the American Medical Association.

Dickerson, Lucian Brown, Clearwater, Fla.; Louisville (Ky.) Medical College, 1903; past president of the Pinellas County Medical Society; member of the American Medical Association; affiliated with Morton F. Plant Hospital; served during World War I; died in Homosassa Springs November 3, aged 75, of coronary occlusion.

Du Four, Emery Holmes, Chicago; University of Illinois College of Medicine, Chicago, 1914; died December 23, aged 69, of chronic myocarditis.

Eisenberg, Joseph Johns ✠ Milwaukee; George Washington University School of Medicine, Washington, D. C., 1914; also a graduate in pharmacy; served during World War I; police surgeon; affiliated with St. Joseph's, Mount Sinai, and West Side hospitals; died November 11, aged 61, of coronary thrombosis.

Gates, Adam John ✠ Tigerton, Wis.; Northwestern University Medical School, Chicago, 1905; an Associate Fellow of the American Medical Association; served during World War I; formerly member of the state board of medical examiners; for many years village president; member of the board of education; died in the Veterans Administration Hospital, Wood, November 5, aged 74, of arteriosclerosis.

Hall, James Lafayette ✠ Vicksburg, Miss.; University of Tennessee College of Medicine, Memphis, 1936; served overseas during World War II; on the staff of the Lutheran Hospital; died November 17, aged 44, of carcinoma of the lung.

Harlan, Delly Lee ✠ Clarence, Mo.; Washington University School of Medicine, St. Louis, 1925; served during World War I; member of the school board; affiliated with Samaritan Hospital in Macon, where he died November 12, aged 53, of cardiorenal vascular disease.

Harris, Harry George, Los Angeles; Detroit College of Medicine, 1904; died November 10, aged 70, of coronary thrombosis.

Irwin, George Howard, Lodi, Wis.; Rush Medical College, Chicago, 1888; member of the American Medical Association; for many years health officer for the villages of Lodi and Okee and the townships of Lodi and West Point; died November 6, aged 83, of heart disease.

Kewer, Leo Thorne, Westwood, Mass.; Tufts College Medical School, Boston, 1913; member of the New England Society of Psychiatry; served overseas during World War I; formerly associated with the Veterans Administration; died in the Norwood (Mass.) Hospital November 24, aged 63, of acute coronary disease.

Knowles, Roy Frank, Brentwood, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1915; member of the American Medical Association; at one time health officer of Phelps County in Rolla; formerly associated with the U. S. Public Health Service Reserve; died November 7, aged 61, of cerebral hemorrhage.

Lee, Joshua Mordecai, Denver; Boston University School of Medicine, 1923; also a graduate in pharmacy; member of the American Society of Physical Medicine, American Congress of Physical Medicine, and the Association of Military Surgeons of the United States; served overseas during World War II; for over four years chief of physical medicine and rehabilitation in the Veterans Administration; died November 30, aged 57, of acute coronary thrombosis.

Levin, Alexander, Chicago; The General Medical College, Chicago, 1924; died November 25, aged 56, of cerebral hemorrhage.

Levy, Maurice ✠ Denver; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1912; member of the American Trudeau Society; on the staff of Mercy Hospital, where he died November 14, aged 61, of coronary disease.

Lewis, Thomas Arthur, St. Louis; Meharry Medical College, Nashville, Tenn., 1914; died in Homer G. Phillips Hospital November 11, aged 67, of pulmonary tuberculosis.

L'Hommedieu, Harold Calvin, Port Washington, N. Y.; Long Island College of Medicine, Brooklyn, 1940; member of the American Medical Association; certified by the National Board of Medical Examiners; served overseas during World War II; affiliated with Nassau Hospital in Mineola; died in Manhasset (N. Y.) Medical Center Hospital November 18, aged 36, of coronary occlusion.

Lippincott, George Coote ✠ Lieutenant, U. S. Navy, retired, Salem, N. J.; Jefferson Medical College of Philadelphia, 1875; also a graduate in pharmacy; entered the U. S. Navy on Sept. 28, 1875, and retired December, 1886, because of incapacity resulting from an incident of service; died November 21, aged 101.

Lucas, Arganey L'Avnire ✠ Chicago, Meharry Medical College, Nashville, Tenn., 1911; on the staff of the Provident Hospital; past president of the Meharry Alumni Association; died December 16, aged 63, of bronchogenic carcinoma.

Lynn, Isaac Wesley, Desert Hot Springs, Calif.; Trinity Medical College, Toronto, Ont., Canada, 1904; member of the American Medical Association; died November 16, aged 80, of a heart attack.

McEwen, Mary Gilruth ✠ Evanston, Ill.; Northwestern University Woman's Medical School, Chicago, 1898; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; formerly professor of clinical gynecology at the University of Illinois College of Medicine; affiliated with St. Francis Hospital; in 1914 was made chairman of social hygiene of the General Federation of Women's Clubs; died November 28, aged 79, of cerebral thrombosis and pneumonia.

McGoldrick, Lynn Pope, Salt Lake City; University of Illinois College of Medicine, Chicago, 1931; died November 24, aged 49.

Maercklein, Otis William Charles, Milwaukee; Marquette University School of Medicine, Milwaukee, 1917; member of the American Medical Association and the Industrial Medical Association; died in Milwaukee Sanitarium, Wauwatosa, November 6, aged 61, of arteriosclerotic heart disease, cerebral arteriosclerosis, and pneumonia.

Marks, Joseph Millard, Valley Falls, Kan.; University Medical College of Kansas City, Mo., 1906; member of the American Medical Association; past president of the Jefferson County Medical Society; for many years county health officer; served in France during World War I; affiliated with St. Francis Hospital in Topeka; died in Research Hospital, Kansas City, Mo., November 3, aged 69, of leukemia.

Masterton, Edward Lincoln ✠ Chicago; University of Illinois College of Medicine, Chicago, 1923; served during World War I; on the staff of South Shore Hospital and Illinois Central Hospital, where he died December 10, aged 55, of cerebral hemorrhage and hypertension.

Mavity, David Everett Hunt, Fowler, Ind.; Gross Medical College, Denver, 1892; member of the American Medical Association; honorary president of the Benton County Tuberculosis Association, which he organized in 1912; served as county health officer; died in St. Elizabeth Hospital, Lafayette, November 16, aged 71, following fracture of the left femur as the result of a fall, and carcinoma of the bowel with liver involvement.

May, Henry Francis, Chicago; Chicago College of Medicine and Surgery, 1917; died in St. Anthony de Padua Hospital November 26, aged 72, of cerebral vascular accident and arteriosclerosis.

Rhymes, Ray Lewis ✠ Meridian, Miss.; Emory University School of Medicine, Atlanta, 1933; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; on the staff of Riley's Hospital, where he died November 28, aged 41, of coronary occlusion.

DIED WHILE IN MILITARY SERVICE

Hooker, Edgar Frank ✠ Commander, U. S. Navy, Philadelphia; Temple University School of Medicine, Philadelphia, 1929; specialist certified by the American Board of Otolaryngology; served during World War II; later entered the medical corps of the regular Navy; medical officer in charge of veterans outpatient service, U. S. Naval Hospital, where he died October 8, aged 51, of cerebral hemorrhage and arteriolar nephrosclerosis.

GOVERNMENT SERVICES

ARMY

Orientation Conferences for Reserve Officers.—The Second Army Surgeon, Brig. Gen. Alvin L. Gorby, and a group of specialists will conduct a series of orientation conferences for Army Medical Service reserve officers in the Second Army area during March, 1952. Following previous policy the Second Army is taking the orientation conferences to the field so as not to infringe on the professional time of medical reserve officers by calling them to Army headquarters. A further convenience is that they are being held on weekends, with a starting time of 1:30 p. m. The itinerary is as follows: Cleveland, March 15; Cincinnati, March 16; Philadelphia, March 22; Richmond, Va., March 23; Pittsburgh, March 29; and Baltimore, March 30. The agenda includes:

Current Status of the Army Medical Service Reserve Program, Col. James B. Mason, MC, special assistant to the Surgeon General.

Strategic Intelligence and World Affairs, G-2 representative, Headquarters Second Army.

The Army Medical Service in Retrospect, Brig. Gen. Alvin L. Gorby, Surgeon, Headquarters Second Army.

Some Recent Advances in Army Medical Research, representative, Medical Research and Development Board, Surgeon General's Office.

One hour of the agenda has been set aside in order that the Army Medical Service reserve officers may hold separate corps meetings. As has been customary in previous conferences, a social hour and dinner are included in the agenda. The meetings will begin promptly at 1:30 p. m. Officers should arrive early in order to finish registration prior to the opening of the session. The orientation conference will close promptly at 9 p. m.

Visit to Facilities in Panama and Puerto Rico.—Brig. Gen. Silas B. Hays, deputy Surgeon General, and Col. Robert L. Black, chief of the medical service corps, left Washington Jan. 28 on an inspection tour in the Panama Canal Zone and Puerto Rico. Both visitors gave special attention to mosquito control and other environmental sanitation measures recently adopted by health authorities in the Canal Zone following reports of jungle yellow fever in nearby Nicaragua, Costa Rica, and Panama. To date, Army and civilian personnel in the Canal Zone have been free of the disease, but authorities are studying new means of combating any outbreak should yellow fever be introduced among Americans in the area.

NAVY

Course in Special Weapons and Radioactive Isotopes on West Coast.—The first course of instruction in medical aspects of special weapons and radioactive isotopes, under the auspices of the Navy's Bureau of Medicine and Surgery, to be given on the west coast, will convene at the Naval Station, Treasure Island, San Francisco, on March 3, 1952. The course will provide inactive reserve medical officers who reside in the 11th, 12th, and 13th Naval Districts, information and techniques that are not available to them as civilians. A similar course has been carried out at the Naval Medical School, Bethesda, Md., during the past three years. Problems likely to be confronted by medical and dental officers in the field of radioactivity will be presented, and techniques employed to counteract these problems will be discussed.

Inactive reserve medical, dental, medical service, nurse corps, and hospital corps officers residing in the 11th, 12th, and 13th Naval Districts who desire to attend this course should submit their request for the six-day training duty to the commandant's office of their respective naval districts at an early date. The acceptance of orders to attend this course of instruction will not, in any way, increase the possibility of involuntary recall to active duty of the personnel concerned.

Award Legion of Merit to Dr. Charles Geschickter.—Dr. Charles F. Geschickter, commander, Medical Corps, U. S. Naval Reserve, has been awarded the Legion of Merit by the President "for exceptionally meritorious conduct in the performance of outstanding services to the Government of the United States during and subsequent to World War II. Recognizing the need by the medical profession for a reference book in pathology while serving as Director of the Department of Pathology in the Naval Medical School, Bethesda, Md., in 1944, Commander Geschickter assumed the responsibility of undertaking this work. He alone wrote the text and gave unstintingly of his time in editing material for the 'Color Atlas of Pathology.' Commander Geschickter has thus contributed essentially to the advancement of medical science and brought distinguished credit to the United States Navy. His meticulous attention to detail, administrative ability, and devotion to the creation and publication of this work reflect the highest credit on Commander Geschickter and the United States Naval Service."

Award Bronze Star to Lt. Neal D. Sanborn.—Lt. Neal D. Sanborn, MC, was presented the Bronze Star with Combat "V" January 16, at the Naval School of Aviation Medicine, Pensacola, Fla. He was cited for heroic achievement in connection with operations against the enemy while serving with a Marine artillery battalion in Korea on July 21, 1951. Serving as battalion surgeon, he displayed outstanding courage and professional skill. When the battalion was subjected to intense enemy artillery and mortar fire, he fearlessly moved from position to position treating casualties and carrying them to positions of comparative safety. He refused to seek safety for himself until all wounded had been rendered aid. His bravery and coolness under fire were an inspiration to all who observed him, and his great professional ability was responsible for saving of many lives. Lieutenant Sanborn's heroic actions were in keeping with the highest traditions of the United States Naval Service. Lieutenant Sanborn is presently undergoing training in aviation medicine that will lead to designation as a Naval Flight Surgeon.

PUBLIC HEALTH SERVICE

Dr. R. R. Spencer Retires.—Dr. R. R. Spencer retired on January 31, after 37 years of service in the Commissioned Corps of the Public Health Service. Dr. Spencer's career has been marked by many achievements, probably the most notable being his part in the development, with the late Dr. R. R. Parker, of a vaccine against Rocky Mountain spotted fever in 1922. The successful development of a vaccine against the disease was a great step forward in the control of infectious diseases and a boon to the populations of tick-infested areas. In 1930 Dr. Spencer's exhibit on Rocky Mountain spotted fever won the American Medical Association's gold medal at its convention in Detroit.

Dr. Spencer has devoted more than a third of his career to the field of cancer. Detailed to the National Cancer Institute soon after its creation in 1937, he served first as executive assistant, then as assistant chief, and from 1943 to 1947 as director of the institute. In 1947 he was released from administrative duties to devote full time to cancer research and supervision of the institute's professional training program. In 1944 he was awarded the Clement Cleveland Medal for his work in cancer health education.

Dr. Spencer has accepted an appointment as a special lecturer in cancer to conduct seminars for physicians throughout the State of Virginia under the joint sponsorship of the State Medical Society, the Old Dominion Medical Society, the Virginia Division of the American Cancer Society, and the University of Virginia. He assumed his new duties on February 1, and will spend the first six weeks in New York City visiting cancer clinics and hospitals to observe the practical application of the newest developments in cancer diagnosis and treatment.

FOREIGN LETTERS

ITALY

National Convention of Internal Medicine.—The 52nd National Convention of Internal Medicine was held in Rome, Oct. 17 through 19, 1951, concurrently with the 53rd National Convention of the Italian Society of Surgery. Prof. Cesare Frugoni, director of the University of Rome Medical Clinic and chairman of the society, was also chairman of the organizing committee.

Obstructions of the Hepatic and Common Bile Ducts.—Hepatic and common bile duct obstructions were discussed jointly with the Society of Surgery. Professor Sotgiu, of the University of Bologna, discussed the medical point of view. Obstruction causes bile stasis; this leads to an increase in pressure, dilatation of the biliary passages, disturbances of the hepatic parenchyma, with regurgitation of bile and cholemia, followed by all the well-known biochemical and clinical alterations. The most important complications of obstruction of the biliary passages are infection of the biliary passages and pancreatic dysfunction. Symptoms of obstruction include the triad of pain, high temperature, and jaundice. Sometimes only two of the three aforementioned symptoms are present, and, in some instances, acute obstruction is monosymptomatic. There may also be concealed forms of incomplete chronic obstruction. The most important of these forms are painful obstruction without colic, dyspeptic obstruction, and pruriginous obstruction. The most important diagnostic procedures are duodenal catheterization, the secretin test, and the test with morphine, secretin, and sulfobromophthalein (bromsulphalein®) sodium, adopted in the Bologna clinic. Obstruction induced by true dyskinesia and inflammation can be cured without surgical intervention.

Diabetes.—Professor Antognetti, from the University of Genoa, and Professor Travia, from the University of Rome, discussed diabetes. Professor Antognetti explained the physiopathology and the clinicopathogenic aspects of the disease and summarized the latest studies and hypotheses regarding the intermediary metabolism of carbohydrates, fats, and proteins. He emphasized the complex and numerous endocrine-sympathetic influences on intermediary metabolism. The hypophysis represents an endocrine diabetogenic complex, but the adrenal cortex and the thyroid gland also contribute to the formation of the diabetogenic constellation. The pancreas, with its insulin secretion, prevails in the antidiabetogenic constellation, but the male sex hormones and the diencephalic centers also influence carbohydrate metabolism. Today, diabetes is considered a morbid syndrome in which the equilibrium between the diabetogenic and antidiabetogenic complexes is altered.

Professor Travia discussed diagnosis, prognosis, and treatment of diabetes and diabetic coma. There are about 54,000 diabetics in Italy, and a similar number of persons have diabetes without knowing it. Diagnosis of diabetes rests mainly on laboratory tests, glycemia, glycosuria, and glycemic curves. Coma is still considered the severest complication of diabetes; before the advent of insulin, it was the primary cause of death among diabetics. Acidosis is another important complication, and arteriosclerotic phenomena may also occur. The prognosis of diabetes has improved greatly since insulin was discovered, and the average life expectancy, which was 44.6 years in 1914, is today 64.5 years. A balanced diet is of great importance in the treatment of diabetes and should contain carbohydrates 41.9%, fats 47.6%, and proteins 10.5%, with the addition of complementary factors, such as vitamins and salts. Another important factor in therapy is insulin administration, the average dose being 30 to 40 units daily. A mixture of slow acting insulin and regular insulin is now used. For patients with diabetic coma, modern authors suggest large doses of insulin (100 units) to be repeated after several hours if necessary.

The items in these letters are contributed by regular correspondents in the various foreign countries.

PARIS

Fourteenth Congress of the International Society of Surgery.—The 14th Congress of the International Society of Surgery took place Sept. 23-29, 1951, at the Sorbonne and the Paris Faculty of Medicine, under the presidency of Prof. R. Leriche, assisted by Drs. Brando-Filho (Rio de Janeiro), C. Crafoord (Stockholm), R. Danis (Brussels), and D. P. Phemister (Chicago), who served as vice-presidents. This meeting coincided with the 50th anniversary of the International Society of Surgery. Over 800 delegates, representing most of the countries of the world, and more than 1,500 members were present. At the opening meeting, Professor Maccas (Athens) spoke on behalf of the foreign delegates. Professor Hartmann, doyen of the French surgeons, eulogized Ver Hoogen, president of the association, and Grey Turner, who presided over the last meeting. The scientific meetings included 11 reports, followed by discussions, and nearly 80 individual communications, which were simultaneously translated into French, English, and Spanish and heard through individual receivers.

Portal Hypertension.—A. H. Blakemore (New York), in discussing portal hypertension, described early attempts to divert the portal circulation by direct or indirect anastomoses. D'Allaines, Lortat-Jacob, and Dubost (Paris) emphasized the difficulties of diagnosing portal hypertension and of interpreting the indications for an operation. Santi and Marion (Lyons) explained that their technique permitted the classification of their patients into three groups: those with hypertension due to alcoholic cirrhosis, those with obstruction in the portal system, and those with cirrhosis of unknown origin. Their results are satisfactory in Banti's syndrome, rather poor in hypertrophic cirrhosis, and unsatisfactory in ascites. Boerema (Amsterdam) stated that the portacaval shunt is indicated only in purely mechanical hypertension due to regional stenosis. He emphasized the danger of persistent hemorrhages of esophageal varices in case of failure. He showed good results obtained with his method of direct attack on these varices: ligation followed by sclerosing injections after temporary esophagostomy.

Vascular Grafts.—Rehn (Fribourg) discards heterografts, using largely venous autoplastic or homoplastic grafts (very young arterial fragments taken from corpses). From a biological, physiological, and morphological study of isolated vascular strips, the author concluded that the best preservation process consists in storing the transplant in blood renewed every fourth day. By this means, a transplant may be kept alive in the refrigerator for 19 days. During warming up, it must be placed in oxygenated Tyrode's solution or stored blood. Dubost and Economos (Paris) reported that the results of homografts in 16 patients were encouraging, especially in 10 cases of Fallot's tetralogy and 2 of coarctation of the aorta.

Artificial Circulation in Surgery of the Heart.—J. Jongblod (Utrecht) thinks that it is preferable to connect an artificial heart to an artificial lung, and he has built an apparatus insuring the circulation in coronary and bronchial arteries and the oxygenation of 4 liters of blood per minute. He was able to maintain artificial circulation in a dog for six hours almost without incident. The animal was killed six weeks later, and no alteration of the myocardium or of the nervous system was found. Kunlin (Paris) described his artificial heart-lung apparatus with which he obtained, in dogs, an output of 1,200 to 1,500 cc. per minute and a 38 minute survival before fibrillation occurred. Dogliotti (Turin) built an apparatus, which does not replace the heart-lung instrument, but which will relieve them in case of failure. One 50-year-old patient, near death during an intervention, was reanimated for 20 minutes, thereby permitting a favorable conclusion of the operation. Bigelow (Toronto) attempted to drain the right heart by progressive cooling; he obtained narcosis without an anesthetic, which allowed him to keep the heart of 39 dogs open and empty for 18 to 20 minutes. Of 139 dogs, 51% were reanimated, and 15% had prolonged survivals.

Films and Television.—Two consecutive series of 40 French and other films, mostly in color, were shown. Two types of television were presented: black and white, transmitted from Professor Mondor's surgical clinic at the Salpetrière Hospital, and color television, transmitted from the Boucicault Hospital in Professor Thalheimer's service.

The next International Congress of Surgery will be held in Lisbon at Easter in 1953 under the presidency of Reynaldo Dos Santos.

SWITZERLAND

First Congress of International Association of Allergists.—This congress was held in Zurich, Sept. 23-29, 1951, under the chairmanship of Dr. Loeffler, head of the medical clinic of Zurich University. There were 1,000 participants from over 30 countries. Dr. Schwarz, dean of the medical faculty of Zurich University, conferred the title of Doctor honoris causa on Dr. Rich, Baltimore, for his studies in experimental pathology, chiefly on tuberculosis, and on Dr. Hirszfeld, Wroclaw, for his research on blood groups in relation to genetics.

Reports covering many topics were read in various sections. These included diagnosis and therapy of allergic disorders, their frequency, and their economic and social influences. It was reported that disability due to asthma is as important economically as that caused by ulcers of the digestive tract. Asthma causes more loss of work than is caused by all fractures, and it causes about twice as much work loss as does tuberculosis. The geographical distribution of allergic diseases, including those caused by house dust, was analyzed. In the special section on histology of allergic lesions it was shown how alterations in immediate and delayed reactions can lead to necrotic reaction, anaphylactoid reaction, and, through hyalinoid granulomatosis, to amyloidosis. Histological study of lesions does not always make possible a diagnosis of allergic disease nor does the presence of eosinophils, which cannot be considered as typically allergic, since they are frequently missing in acute reactions. A specific hereditary constitution predisposing to allergy was discussed, and genealogical histories of polyallergic families were reported. It was reported that cases of allergy may be based on the Rh factor and may be provoked by abortion. Experiments designed to provoke bronchial asthma in guinea pigs and, thus, to analyze the psychic factor in the etiology of bronchial asthma were described. The mechanism of the action of antihistaminics, and the action of corticotropin (ACTH) and cortisone were discussed. Improvement in standardization of allergens was reported; this will permit more precise study of the pathogenic and pharmacodynamic problems of allergic reactions. A committee for nomenclature will try, in the coming years, to unify standards and definitions.

The new executive committee is as follows: president, Dr. F. W. Wittich (Minneapolis) until 1955, followed by Dr. S. Feinberg (Chicago); vice-president, Dr. U. Fabiano Aliez (Brazil), Dr. V. Radot (France), and Dr. Q. Williams (Great Britain); general secretary, Dr. B. Halpern (France); treasurer, Dr. A. Grumbach (Switzerland). The other members of the committee are Dr. W. Loeffler (Zurich), Dr. Brun (Denmark), Drs. A. Brown and F. Rackemann (United States), and Dr. S. Mallen (Mexico).

Symposium on Influence of Pituitary Gland and Cortex of Adrenal Gland on Biologic Reactions.—A symposium on the influence of the pituitary gland and the cortex of the adrenal gland on biologic reactions was held on the two days immediately following the allergists' congress. It was presided over by Dr. Miescher, head of the dermatologic clinic of Zurich University. Four reports were read. The first, by Dr. Levine, Chicago, was on the role of the suprarenal gland in tissue reactions, emphasizing the importance of the neurovascular system; the second, by Dr. M. Taubenhaus, Chicago, was on synergy and antagonism in tissue reactions; the third, by Dr. G. Shwartzman, New York, was on hemorrhagic reactions; and the last, by Dr. J. Dougherty, Salt Lake City, was on the problems of anaphylaxis and the action of corticotropin and cortisone in relation to the formation of antibodies.

TURKEY

Effect of Aureomycin and Terramycin on Rabies Virus.—In the *Turkish Bulletin of Hygiene and Experimental Biology*, Prof. Zühdü Berke, of the Ankara Refik Saydam Institute of Hygiene, and Dr. Abdülkadir Çilesiz, virologist, published the results of experiments on the effect of the new antibiotics aureomycin and terramycin on the rabies virus in rabbits. In one series of experiments rabbits were given a 1 cc. intramuscular injection of a 1:100 diluted fixed virus solution. Beginning with the fifth day of infection, they were given an intravenous injection of a 5%, slightly alkaline, glucose solution with 0.2 gm. of aureomycin, twice daily. Paralysis set in from 9 to 12 days after the virus injection and the animals died from 5 to 7 days after the aureomycin injection. In a group of control animals, paralysis set in on the fifth day after the virus injection, and the animals died the following night.

Solutions containing 0.025, 0.05, 0.1, and 0.2 gm. of terramycin were put in test tubes, and 2 cc. of a 1:200 emulsion of fixed virus was added to each. After two hours the virus was inactivated. Animals receiving 0.2 cc. of any of these solutions by intracerebral injection did not die, while all control animals died on the fifth day after rabies had developed. Rabbits injected with fixed virus and receiving 0.055 gm. per kilogram of body weight of terramycin on the fourth day and 0.11 gm. on the fifth day died on the same day as the control animals.

Medical Students Holiday.—Every year, on March 14, medical students have a holiday. Instead of classes there are lectures on Turkish medical history by professors of the two medical schools. This year marked the 125th celebration. The holiday was introduced by Sultan Mahmoud II (1785-1839), who founded the first modern medical school at Istanbul in 1827. There were centers of medical teaching of the scholastic types under the reign of Sultan Fatih, the Conqueror (1430-1481) and Sultan Suleiman I, the Magnificent (1520-1566). Under Sultan Abdul Hamid II (1876-1909), there were two medical schools in Istanbul, one for the training of physicians for the army and one for physicians for the civilian population. In 1909, after the adoption of the constitution, the two schools merged and became known as Istanbul University Medical Faculty at Haidar Pasha. In 1945 a second medical school was established at Ankara University.

Death of Mazhar Osman Uzman.—Prof. Mazhar Osman Uzman, department of psychiatry, Istanbul University, died recently of a heart attack, at the age of 68. A graduate of Istanbul Imperial Military Medical Academy, he served two years as intern at the academy's Gülhane Hospital, Istanbul-Sarayburnu, and was appointed clinic chief and associate professor at the academy in 1906. He studied in Berlin and Munich in 1908, and, on his return to Istanbul in 1911, he was appointed professor at the Military Medical Academy. He served in the Balkan War, was chief of the Istanbul-Shishli Observation Hospital, and consultant-specialist for mental and nervous disorders at the Haydar-Pasha Military Hospital. From 1918 to 1923, he was chief of the Üsküdar-Toptashi Mental Hospital and the Zeyneb Kamil Hospital. Professor Uzman reorganized the Toptashi Hospital, introducing modern methods of treatment and care. Gathering around him a group of enthusiastic, promising students, he fostered an interest in mental and nervous disorders and was instrumental in sending these students to France and Germany for postgraduate study. He worked tirelessly for the removal of the patients from the Toptashi Asylum to the modern 3,000-bed mental hospital in Bakirköy, which he directed for 10 years. When Istanbul University was reorganized in 1933, he was appointed professor of the department of psychiatry. He was one of the founders of the Turkish Society of Mental and Nervous Diseases, the Antialcoholic Society (Green Crescent), and a member and correspondent of foreign medical societies. He wrote a dozen books on many aspects of psychiatry, the treatment of mental disorders, and drug addiction. At the request of the League of Nations, he wrote a report on drug addiction in relation to dementia precox. For 30 years he contributed innumerable articles to *Istanbul Clinic*, which he founded, and to other medical journals. During his 45 years as a teacher, his extensive knowledge, powerful personality, and skilful oratory earned him the admiration of students and colleagues.

CORRESPONDENCE

SKIN TESTING WITH COSMETICS

To the Editor:—Our attention was called to the fallacy of the preliminary tests patients make on themselves, supposedly to assure their safety from irritation of certain substances, often cosmetics and especially hair dyes. Recently, we have seen cases of severe dermatitis of the face, neck, and ears among women who first proudly, and then with disillusionment, stated, "I did the test just as the manufacturer told me to, and now look at me!"

This is the fallacy. Apparently, neither patients nor some manufacturers realize that a test done on the normal body will be negative, but that after exposure there is a period during which sensitization develops, and the same test performed a week or so later may prove quite positive. Thus, a woman will apply a hair dye convincingly ballyhooed and obtain no reaction from her first test; then, when she uses the product two or three weeks later, severe dermatitis may result. The manufacturer does not stress in his advertising this possibility of the development of sensitization. It ought to be stressed.

So, self-interpretation of preliminary tests is often at fault. Further, it is even conceivable that in some persons the original self-testing may initiate the sensitization.

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ANTABUSE® AND BARBITURATES

To the Editor:—Giarman, Flick, and White in "Prolongation of Thiopental Anesthesia in the Mouse by Premedication with Tetraethylthiuram Disulfide ('Antabuse')" (*Science* **114:**35 [July 13] 1951) show that premedication of mice with antabuse® markedly potentiates the effect of thiopental (pentothal®) sodium, the anesthesia time being increased sixtyfold. Graham, Carmichael, and Allmark in The *in Vivo* Potentiation of Barbiturates by Tetraethylthiuram Disulfide (*J. Pharm. & Pharmacol.* **3:**497 [Aug.] 1951) demonstrate a similar effect in rats and guinea pigs, with sodium cyclural (hexobarbital sodium, evipal® soluble) and sodium phenobarbitone (sodium phenobarbital, luminal® sodium). The sleeping time was approximately doubled.

Although, so far as the writer is aware, the potentiation of barbiturates in man by antabuse® has not been recorded, it is evident that, until data on this point are available, great caution should be observed in permitting the use of barbiturates in persons treated with antabuse.® The effects on such persons of even small doses of barbiturates might be much greater than normal and lead to added dangers in the operation of machines, automobiles, and the like. Such circumstances might be rather likely to occur, since a chronic alcoholic being deprived of alcohol might well present indications for sedative medication with the barbiturates.

Giarman and co-workers suggest caution in administering thiopental to persons treated with antabuse.® In view of the confirmatory and more extensive results of Graham and associates and the recent release of the drug for prescription use, it would appear that the warning should be strongly emphasized to physicians administering antabuse® to patients.

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PSYCHOTHERAPY AND CANCER

To the Editor:—The case described in a letter by Dr. W. G. Eliasberg (Psychotherapy in Cancer Patients, *J. A. M. A.* **147:**525 [Sept. 29] 1951) and also reported by Dr. Otto Kant (Deceptive Psychoneurosis, *Psychiatric Quarterly* **20:**129 [Jan.] 1946) certainly needs further serious comment. Psychotherapy ostensibly suppressed the main symptoms of pain and improved the general attitude and behavior in this "mental" case, which autopsy ultimately proved to be carcinoma of the pancreas with widespread metastases and sudden death due to pulmonary embolism.

It has been known for some time and it has again been recently stressed by Dr. Irving J. Sands, of the department of neurology at Columbia (Proceedings of 145th Annual Meeting of the Medical Society of the State of New York, Section on Neurology and Psychiatry, May 4, 1951, *N. Y. State J. M.* **51:**2370 [Oct. 15] 1951) that true somatic disease may precipitate psychiatric disorders by interfering with the cerebral circulation. We know that the nature of malignant neoplasm is to metastasize and usually to throw off thrombi, microscopic and, later, macroscopic, as undoubtedly occurred in the case in question. The lesson learned here, in my opinion, is not so much from the influence of psychotherapy on pain and behaviorism but from the failure to recognize advanced malignancy during life. This was made difficult by overemphasis and assurance on applied psychotherapy.

Without going into a lengthy discussion, I need only mention that some patients with cancer of the pancreas have excruciating pain at the level of that organ with automatic lytic diminution of that pain as the disease progresses, with or without personality disorders. Certainly, Dr. Eliasberg's patient, who this time knew that he really was sick, cannot really be blamed for being "concerned with himself," inasmuch as the psychiatric approaches failed to utilize that knowledge. Psychotherapeutic dynamics producing powerful anabolic endocrine stimuli apparently kept this dying man on his feet until the last moment, but at a cost, it seems to me, to the prestige of the medical profession.

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HOSPITAL MANAGEMENT

To the Editor:—I have just read the item entitled "Hospital Management Called Uneconomical," which appeared in Washington News of the December 8 issue of THE JOURNAL, which purports to be the reporting of a talk I gave at the Annual Conference of the Maryland-District of Columbia-Delaware Hospital Association in Washington, D. C., on Nov. 26.

I cannot let go unchallenged the very poor reporting in this article. I feel that the statement reflects unfairly on hospitals and hospital administrators and is a gross distortion of my talk and that I must try to correct the erroneous statements and quotations attributed to me. I wish to contradict flatly the opening statement that I believe "hospital management in general is uneconomical." I do not hold such a belief, nor did I express any such opinion at the meeting referred to or elsewhere. This is not to say that the management of hospitals, like most other businesses, cannot be improved and economies and increased operating efficiencies obtained. It was to this objective that my talk was directed; namely, that hospital management must constantly seek improvement. My entire talk was devoted to a discussion of accomplishing improvement through the use of the technique of management commonly referred to as a management audit. My talk was specific and dealt with three aspects of management audits or appraisals; namely, what a management audit or appraisal is, the need for the use of this management tool, and how to use it to improve management.

Whoever wrote the article in Washington News appears to have taken a few of my remarks completely out of context. I could not "get away" with telling a group of hospital executives that (to quote THE JOURNAL statement) "no other industry could survive under the loose, wasteful system that characterizes the management of hospitals." What I actually stated in my talk was that large industries had already learned that they could not afford to be without the use of periodic management appraisals

of their operations if they are to survive in present day competitive markets. I emphasized that since the hospital business ranks fifth or sixth in dollar volume in this country, hospitals should capitalize on industry's experience and learn how to eliminate any wasteful expenditures and obtain maximum efficiency.

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COUNCIL ON MEDICAL SERVICE

EMERGENCY MEDICAL CALL PROGRAMS

The layman argues that, if he is unable to obtain the services of a physician whenever one is needed, the profession is not serving the public properly. Every time a patient complains that he has not been able to secure emergency medical treatment, the reputation of the profession suffers. This is true even though a physician may have been available, but the patient did not know how to contact him. It is, therefore, gratifying to note that an ever-increasing number of medical societies have organized or are organizing emergency medical call programs, designed to provide medical care at any hour for the person who cannot contact his own physician or who does not have a personal physician.

THE NATIONAL PICTURE

Rapid strides have been made in developing emergency call systems. In 1948, only about 60 medical societies reported having a formal plan for handling emergency and night calls; in 1949, the number was estimated at between 100 and 120; and in 1950, it had risen to over 350. While every county or city has real emergency cases, not every county medical society needs a formal or organized program for handling emergencies. Those counties with few residents and few physicians may effectively rely on the normal physician-patient relationships in emergencies. In the heavily populated county, on the other hand, the greater number of physicians not only makes it difficult for the patient to check through the whole list to find one available but also makes it difficult for physicians to make any informal arrangement for one of their number to be on call at all times. In view of this, the distribution by size of county society of the 364 emergency call plans reported to the Council on Medical Service in 1950 is more reassuring than the number of plans itself would indicate. As the table shows, over 80% of the large medical societies, groups 3 and 4, now have emergency call plans. It is apparent from the table that attention should be focused on the smaller medical societies. This has been done in a study made this fall by the Council on Medical Service.

Distribution of Emergency Call Plans

	Total No. of Societies	No. of Societies Reporting Plans	Percentage of Societies with Plans
Group 1 (less than 100 members).....	1,705	219	13%
Group 2 (100-200 members).....	114	53	46%
Group 3 (200-300 members).....	40	29	72%
Group 4 (over 300 members).....	71	63	88%
Total.....	1,930	364	

SURVEY OF COUNTY MEDICAL SOCIETIES

The Council on Medical Service recently surveyed the emergency call methods employed by 143 county medical societies to learn the various methods employed in handling this problem. Of this number, 108 have organized or formal plans; 11 are in the process of either formulating such plans or reorganizing plans that have proved inefficient; 5 did not provide sufficient information to be classified; and 19 find the regular physician-patient relationship adequate for emergencies. The plans studied are located in 38 states and the Territory of Hawaii and serve counties ranging from 10,000 to over 1,000,000 population. To provide data for the solution of the primary problem, that of organizing plans in the smaller communities, the majority of the plans studied are those of societies in groups 1 and 2 (table 1). The breakdown of plans by size of medical society is as follows: 55 plans in groups 1, 34 in group 2, 17 in groups 3, and 37 in group 4. The Council plans to present the information concerning these programs in a pamphlet designed particularly for county medical societies. The information is already available in mimeographed form for medical society officers at the Council office.

TYPES OF PLANS

Some counties have such a small population and so few physicians that the only possible plan is an agreement among the physicians that one of their number will be available at all times. This, of course, is the least complicated method and is probably adequate for the majority of the 1,930 county societies, since almost 90% of them are in group 1. Among medical societies with less than 100 members which have an organized plan, the local hospital (or hospitals) is generally the agency through which emergency calls are handled. In such counties, all or nearly all of the physicians are staff members of the local hospital (or hospitals) and its switchboard provides the most convenient central office for receiving calls and contacting physicians.

Medical societies with from 100 to 200 members also use local hospitals as dispatching agencies but generally prefer to utilize the services of private telephone exchanges. Here, the number of hospitals complicates efficient dispatching and, since there is seldom more than one private telephone exchange, the one in operation offers the most centralized service.

The larger medical societies—more than 200 members—also prefer to use private telephone exchanges, although approximately one-third have established society owned and operated telephone services. Some county societies use several hospital switchboards or telephone answering services or a combination of both; however, except in the counties where geographical characteristics make it necessary to have separate emergency rosters for each district, it appears more efficient to use one central switchboard for all emergency calls. Whether this central dispatching office is a hospital, a private telephone service, or a medical society switchboard depends entirely on local conditions. A single agency seems more desirable than a multiple service, since it not only speeds contact with the physician by avoiding confusion as to which number the patient should call but also places the responsibility for securing a physician upon one organization.

THE EMERGENCY PANEL

Theoretically, every physician should do his share in caring for emergencies, and in many of the smaller county societies all members are required to serve on the emergency panel. In the larger medical societies, on the other hand, the various specialties complicate the problem and make it almost necessary to set up the emergency panel on a volunteer basis. Some panels do provide for specialist listings, but usually they are limited to general practitioners. Thus, of the 58 societies reporting that their rosters are made up of volunteers, 41 were in counties with more than 100,000 population; and, of the 16 societies that reported that all members physically able to do so were called upon to serve, 12 are in counties with less than 100,000 population. In the smaller counties, the panel members are generally scheduled to handle calls for a set period, anywhere from one

day to one month in duration. In the large counties the panel members are usually selected in rotation, a different physician being called for each emergency.

FUNCTION OF DISPATCHING AGENCY

The function of an emergency call dispatching agency, whether it be a hospital, private telephone exchange, or medical society switchboard, goes beyond that of the regular telephone answering service. Having accepted the responsibility of getting a physician in an emergency, the agency should assume responsibility for contacting the physician rather than merely supplying the caller with the names of one or more physicians. The agency should also receive reasonable assurance from the physician that he will make the emergency call.

Lists of all such calls, together with the facts as to their handling, should be kept by the dispatching agency and reported at regular intervals to the medical society. It is through such information that the medical society learns the extent of the problem and of the cooperation or lack of cooperation on the part of the membership.

MEDICAL SOCIETY FUNCTION

Development of an efficient emergency call plan is an important step any medical society can take toward assuring the public that medical care will be available when needed. It is true that emergencies are few in number when compared to all other medical care services, but their inherent possibilities for unsavory headlines make them a primary problem to be solved. It is almost axiomatic to say, "Take care of the emergencies and the routine will take care of itself."

Medical societies, then, have a definite function to perform in making sure that no emergency call goes unanswered. Individual physicians, of course, provide the medical service, but medical societies must provide for unity and direction of individual physician effort to the end that all emergency calls are cared for promptly. Having arranged for medical care of emergencies, it then behooves the medical society to publicize this program widely and continuously. Regardless of the type of emergency call program developed, the effort will be lost unless the public is aware of it and how it should be used.

Planning and arranging for adequate medical service programs in any community, large or small, is not a one way street. Public neglect or abuse of any medical service program can cause its failure. The citizens, too, have a responsibility in their local emergency call plan, namely, to use the service only when necessary. This should be clear to them from the outset. Emergency call plans are for the benefit of the public and require the cooperation of the public.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Malpractice: Necessity for Expert Testimony.—The plaintiff filed suit for damages alleged to have resulted from the improper setting of the plaintiff's fractured ankle by the defendant physician. From a judgment in favor of the defendant, the plaintiff appealed to the Supreme Court of Washington.

The plaintiff fractured an ankle as the result of a fall from a bicycle and was taken to the office of the defendant, her family physician. He took an X-ray of the injury, and diagnosed a fracture of the posterior lip of the tibia, which was shoved up and displaced upward to a sixteenth of an inch, and which he attempted to put back in place, but was not altogether successful. After setting the fracture, he put a stockinette on the ankle and placed it in a plaster cast. The accident occurred on the 7th of May and the defendant saw the plaintiff many times until about September 1st, the cast having been removed on July 13th. No X-ray was taken while the cast was on. However, one was taken immediately after the removal of the cast on July 13th. It showed the posterior lip of the tibia to be in exactly the same position as it was when the first picture was taken. The defendant told the plaintiff that the second X-ray showed a good, firm union, and that the alignment of the bone was good. The plaintiff continued to suffer severe pain, however, and on October 22nd, having moved to Spokane, the plaintiff consulted a Dr. Grieve, who found the ankle swollen and the foot displaced posteriorly.

The plaintiff first contended that the defendant physician was negligent in failing to reduce the swelling of the ankle joint. At the trial Dr. Grieve testified that in his opinion the swelling was caused by circulatory disturbances of the soft tissue. He thought there was a possibility that nature would take care of that and recommended physiotherapy, which was not effective. Negligence on the part of a physician or surgeon, said the Supreme Court, must be established by medical testimony and there was nothing in Dr. Grieve's testimony on which a jury could base a finding that the swelling was the result of any act or omission of the defendant.

The plaintiff next contended that the defendant failed to set the broken ankle properly. Dr. Grieve testified that the over-all alignment was good but that the posterior lip of the tibia was still displaced slightly, and that that is a very vital part as far as function is concerned. He also testified that he had treated fractures of this type where he did not get a good result, even with an open reduction. He testified that his procedure to reduce fractures of this kind was to give a general anesthetic, manipulate the ankle and apply a cast, and check it with an X-ray to see that he had the proper alignment. He did not testify, however, that the defendant used the wrong procedure, or that he failed to do anything in conformity with correct procedure.

As to whether or not the defendant negligently failed to employ the X-ray after he had set the ankle to ascertain whether or not a satisfactory union had been secured, Dr. Grieve testified that one cannot get a clear picture through the cast and that a picture through the cast would not have benefited the defendant in this instance in ascertaining whether or not a satisfactory union had been secured.

The plaintiff also charged that the defendant negligently failed to care for the plaintiff following the accident by reason of the fact that he departed on a vacation without first removing the cast from the ankle. Dr. Grieve testified that a fractured ankle such as the plaintiff's should be kept in the cast until there was a good bony union; that it might take a year. He had no recollection of having told the plaintiff that the cast had been on too long. When asked if it was possible that he made that statement, he replied: "It is possible, but three months is not a particularly long time to have a cast on a thing of that nature."

We cannot start out with the premise that the plaintiff will have a stiff ankle for the rest of her life, and conclude therefrom that her condition is due to the negligence of the defendant, said the Supreme Court. We must find that the defendant did something in the treatment of his patient which the recognized standard of medical practice in his community forbids in such cases, or that he neglected to do something required by those standards. This question can only be determined by medical evidence and the Supreme Court was of the opinion that the evidence was insufficient to warrant submitting to the jury the question of the defendant's negligence in setting the fractured ankle.

Accordingly the judgment of the trial court in favor of the defendant physician was affirmed.—*Derr v. Bonney, 231 P. (2d) 637 (Washington, 1951).*

MEDICAL LITERATURE ABSTRACTS

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Effect of Vasopressin (Pitressin®)-Induced Water Retention on Sodium Excretion. B. C. Holland and E. G. Stead Jr.—p. 571.

Adaptation to Anoxia in Chronic Pulmonary Emphysema. R. H. Wilson, C. W. Borden and R. V. Ebert.—p. 581.

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*Oral Use of Cation-Exchange Resins in Treatment of Edema. K. Emerson Jr., S. S. Kahn, J. W. Vester and K. D. Nelson.—p. 605.

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*Dermatomyositis. C. Sheard Jr.—p. 640.

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Nonspecific Granuloma of Rectum and Sigmoid Colon: Lesions of Rectum and Sigmoid Colon Which Clinically Simulated Cancer but Which Responded to Aureomycin Therapy. M. S. Belle, S. Fox and R. Allen. —p. 685.

Fat Embolism. E. P. Carreau and G. A. Higgins.—p. 692.

Hemochromatosis.—From a study of 23 cases of hemochromatosis the authors reached the following conclusions: This disease starts early in life (probably before puberty) and runs a slow, progressive course. Early diagnostic signs are pigmentation of the skin (especially on the forearms), sparsity of body hair, hepatomegaly, and weakness. The diagnosis can be confirmed best by demonstrating hemosiderin in the liver or gastric mucosa by biopsy. A constitutional factor in the causation of hemochromatosis is suggested by its occasional occurrence in siblings and by the lifelong sparsity of body hair in male patients that antedates by many years evidence of sexual regression. Exogenous toxins and malnutrition are excluded, and alcoholism is ruled out as the main factor, in the etiology of this disease. Recent investigations favor the hypothesis that excessive deposits of hemosiderin in normal storage depots of the body, secondary to excessive intestinal absorption of iron, are responsible for the disturbances of function and structure in hemochromatosis. In their series the authors observed that: (1) Excessive intestinal absorption of iron in hemochromatosis was not induced by alterations in the iron-phosphate ratio in the diet. (2) Two-thirds of the patients had serum iron levels exceeding the upper limits of normal. (3) Menstrual loss of iron was less than normal in the three women in this series. (4) Cirrhosis of the liver in hemochromatosis was clinically, functionally, and histologically relatively benign as compared with other types of cirrhosis with a comparable degree of fibrosis. (5) Pancreatic function tests in many cases showed impairment in digestion of gelatin, and hypersecretion of dilute pancreatic juice in response to secretin. (6) Electrolyte and blood pressure studies did not support the view that pigmentation and weakness in hemochromatosis are due to adrenocortical deficiency. (7) The slaty pigmentation was due not to deposition of hemosiderin in the skin but to increased amounts of melanin in the basal layer of the thinned epidermis.

Cation-Exchange Resins in Edema.—The authors investigated the immediate and long term results of oral administration of cation-exchange resins in 14 patients with edema from various causes. They concluded that this was a practical and effective procedure for reduction of edema by removal of sodium from the intestinal tract. The amount of sodium removed ranged from 0.25 to 0.8 mEq. per gram of resin, sometimes reaching higher levels for short periods. This amount was only partially dependent on the sodium ingested. It was possible to remove sodium from body fluids and thereby achieve a negative sodium balance. A daily dose of 45 gm. of resin may be expected to remove approximately 2 gm. of sodium chloride. Larger doses may be given but are likely to be poorly tolerated because of their bulk. Since most resins remove more potassium than sodium, at least 1.3 mEq. of potassium (equivalent to 0.1 gm. of potassium chloride) must be supplied per gram of resin administered. Small calcium supplements should probably be given in addition. The authors caution against the use of resin-therapy in patients with renal insufficiency, since the loss of base in the feces must be compensated for by renal ammonia and acid production or systemic acidosis will result. The advantage of resin therapy is that it withdraws sodium slowly and steadily over prolonged periods without the sudden fluctuations induced by most diuretics. The disadvantages lie in the large quantity of material that must be ingested daily, the possibility of gastric irritation, and the danger of inducing acidosis in patients with renal disease, or potassium depletion if potassium supplements are not given.

Dermatomyositis.—Sheard reports on three patients in whom dermatomyositis was associated with visceral carcinoma, and reviews a number of additional cases previously reported. He then analyzes the histories of 25 cases of dermatomyositis without carcinoma for characteristic clinical and laboratory findings. An eruption on the face or hands was the initial symptom in over half the patients. Muscular weakness was shown by all, and the majority complained of pain in the muscles. Joint pains, dysphagia, serositis, edema, calcinosis, induration of the skin, and Raynaud's phenomenon were other symptoms. Many patients showed mild anemia, increased sedimentation rate, albuminuria, and electrocardiographic changes suggesting myocardial damage. The disease usually had a gradual onset. It tended to run a short course with high mortality in children and young adults and a longer course with eventual recovery in older adults. After reviewing the etiological and pathological aspects of the disease, the author concludes that a search for malignant tumors, focal infection, and endocrine disturbances should be made in every case of dermatomyositis.

American J. Digestive Diseases, Fort Wayne, Ind.

18:293-322 (Oct.) 1951

Cause of Fat Necrosis Following Excision of Pancreatic Duct from Duodenum. H. L. Popper and H. Necheles.—p. 293.

Healing of Peptic Ulcer. M. Feldman and T. Weinberg.—p. 295.

Healing of Primary Duodenal Ulcer with Later Development of Gastric Ulcer. S. Morrison and M. Feldman.—p. 296.

Effect of Chloride Concentration in Determination of Lysozyme Activity. O. E. Lobstein and S. J. Fogelson.—p. 298.

Relation of Functional Hyperinsulinism to Visceroptosis: Report of 21 Consecutive Cases. H. Layzer.—p. 300.

Correlation of Punch Liver Biopsy with Autopsy Material. C. P. Giesen, J. E. Koepsell, E. V. Hastings and M. C. F. Lindert.—p. 304.

Bulk and Anthracene in Treatment of Functional Constipation. M. M. Marks.—p. 307.

Cases in Geriatrics and Problem of the Physician's Outlook. M. Golob. —p. 308.

Present Dietary Considerations in Liver Disease. A. C. Johnson.—p. 311.

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Titles marked with an asterisk (*) are abstracted.

American Journal of Hygiene, Baltimore

54:157-294 (Sept.) 1951

Use of Adjuvants to Facilitate Studies on Immunologic Classification of Poliomyelitis Viruses. J. E. Salk, L. J. Lewis, J. S. Youngner and B. L. Bennett.—p. 157.

Second Attacks of Paralytic Poliomyelitis in Human Beings in Relation to Immunity, Virus Types and Virulence: With Report of Two Cases, and Four Other Individuals in Baltimore, 1944, Infected with Virus of Leon Type. D. Bodian.—p. 174.

Immunologic Classification of Poliomyelitis Viruses: I. Cooperative Program for Typing of 100 Strains. The Committee on Typing of the National Foundation for Infantile Paralysis. C. Armstrong and others. —p. 191.

Id.: II. Results Obtained with Method for Testing Resistance of Monkeys Immunized with Prototype Viruses. J. F. Kessel, C. F. Pait, U. Pentti Kokko, L. P. Gebhardt and others.—p. 205.

Id.: III. Results Obtained with Method of Neutralization with Prototype Antisera. J. E. Salk, B. L. Bennett, L. J. Lewis and others.—p. 216.

Id.: IV. Results of Typing by Neutralization of Prototype Viruses with Antiserum Produced by Vaccinating Monkeys with Unknown Strain and an Adjuvant. J. E. Salk, J. S. Youngner, L. J. Lewis and B. L. Bennett.—p. 255.

Id.: V. Discussion of Results and General Summary. The Committee on Typing of the National Foundation for Infantile Paralysis.—p. 268.

Antibodies to Three Different Antigenic Types of Poliomyelitis Virus in Sera from North Alaskan Eskimos. J. R. Paul, J. T. Riordan and J. L. Melnick.—p. 275.

Studies on Cultivation of Poliomyelitis Viruses in Tissue Culture: V. Direct Isolation and Serologic Identification of Virus Strains in Tissue Culture from Patients with Nonparalytic and Paralytic Poliomyelitis. F. C. Robbins, J. F. Enders, T. H. Weller and G. L. Florentino. —p. 286.

American Journal of Medicine, New York

11:409-534 (Oct.) 1951

Auricular Flutter. M. Prinzmetal, E. Corday, R. W. Oblath and others. —p. 410.

*Use of Pronestyl in Treatment of Ectopic Rhythm: Treatment of 98 Episodes in 78 Patients. K. Berry, E. L. Garlett, S. Bellet and W. I. Gefter.—p. 431.

Effect of Isuprel (Isopropylepinephrine) on Circulation of Normal Man. J. Kaufman, A. Iglauer and G. K. Herwitz.—p. 442.

Re-Evaluation of Reliability of Pharmacologic and Cold Pressor Studies in Hypertension and Pheochromocytoma. J. A. Evans, H. J. Rubitsky, C. C. Bartels and E. C. Bartels.—p. 448.

*Pharmacologic Basis of Various Tests Used in Diagnosis of Pheochromocytoma. G. Entwisle, C. A. Stone and E. R. Loew.—p. 461.

Protein-Lipid Relationships in Human Plasma: I. In Normal Individuals. E. M. Russ, H. A. Eder and D. P. Barr.—p. 468.

Id.: II. In Atherosclerosis and Related Conditions. D. P. Barr, E. M. Russ and H. A. Eder.—p. 480.

Procaine Amide in Ectopic Rhythms.—Procaine amide ("pronestyl") differs structurally from procaine in that the *p*-aminobenzoic acid and the diethylaminoethanol are bound through an NH group rather than by an ester linkage. Procaine amide is not affected by the procaine esterase of the body and consequently is effective orally or intravenously. This drug was used by Berry and associates in 98 episodes of electrocardiographically proven arrhythmias in 78 patients. The drug was administered intravenously 24 times (to 21 patients) until the ectopic rhythm was abolished, then orally in maintenance doses 26 times (to 12 patients); and only orally 48 times (to 45 patients). The intravenous preparation was administered at a rate of not more than 200 mg. per minute under constant electrocardiographic control until the electrocardiogram showed normal sinus rhythm, until toxic manifestations were observed, or until a total of 1 gm. had been given. The effective oral dose varied widely and was established largely by trial. The usual dose given was 0.5 to 1 gm. every four hours. Oral administration is considered the method of choice, but the intravenous administration of procaine amide is believed safer than the corresponding effective dose of quinidine administered by the same route. The arrhythmias treated included the following types: ventricular tachycardia, nodal tachycardia, paroxysmal auricular tachycardia, auricular flutter, auricular fibrillation, and multiple premature ventricular contractions. Procaine amide was effective in converting a large proportion of these arrhythmias to normal. It was notably unsuccessful in converting auricular flutter or auricular fibrillation to a normal rhythm. Hypotension, which in two patients resulted in the production of coronary insufficiency and in two others produced convulsive seizures, was the most serious toxic manifestation. To guard against it, it is suggested that the intravenous preparation be given no faster than 100 mg. per minute, and continuous electrocardiographic records and repeated blood pressure determinations be made during the administration. Procaine amide is an important addition to the therapeutic armamentarium in ectopic rhythms, particularly those of ventricular origin.

Pharmacologic Basis of Tests for Pheochromocytoma.—Entwisle and associates review the published evidence and their own experimental observations of the pharmacologic actions of various substances used in diagnosis of pheochromocytoma. They show that these tests can be divided into two groups, depending on whether a paroxysmal attack is induced or whether there is blockage of circulating epinephrine and/or arterenol. Histamine and tetraethylammonium bromide probably induce attacks by a direct stimulation of the adrenal medullary tissue. The mechanism of action of methacholine (mecholyl®) in inducing attacks in patients with pheochromocytoma is still not clear. It may be due in part to direct stimulation of the chromaffin tumor and/or reflex stimulation due to a preliminary fall in blood pressure. The adrenergic blocking agents prevent the pressor responses to the circulating epinephrine and arterenol liberated from the adrenal tumors.

American Journal of Psychiatry, New York

108:321-400 (Nov.) 1951

Present Status and Future Needs of Psychiatric Facilities in General Hospitals in the United States and Canada. A. E. Bennett, E. A. Hargrove and B. Engle.—p. 321.

Evaluation of Immediate and Late Results of Prefrontal Lobotomy in 600 Cases, Including Case of Postencephalitis and Other Organic States. H. J. Worthing, H. Brill and H. Wigderson.—p. 328.

Anosognosia: Report of Case of Anosognosia for Blindness. H. Oppenheimer and M. Weissman.—p. 337.

Astrocytoma of Left Temporal Lobe: Contribution to Problem of Psychopathology of Epileptic Personality Disorder, and to Problem of Semantic Aphasia. E. G. Winkler, G. V. Freiman and S. S. Lieberman. —p. 343.

Group Therapy for Parents of Behavior Problem Children in Public Schools: Failure of Method in a Negro School. J. Kahn, A. D. Buchmueller and M. C. L. Gildea.—p. 351.

Use of Group Processes in Teaching Group Dynamics. E. V. Semrad and J. Arsenian.—p. 358.

Psychological Factors in Women with Peptic Ulcers. E. Kezur, F. T. Kapp and M. Rosenbaum.—p. 368.

Helping Teachers Appreciate Emotional Problems in Children. H. Farmer and W. B. Rossman.—p. 374.

Hypnosis Reading List for Professional Instruction. J. M. Schneck. —p. 381.

Am. Practitioner & Digest of Treatment, Philadelphia

2:921-1008 (Nov.) 1951

Osteoporosis, Osteomalacia and Osteitis Fibrosa Cystica, with Special Reference to Parathyroid and Calcium Metabolism. E. H. Winn and A. S. Minot.—p. 921.

*Chronic Relapsing Pancreatitis. F. E. McDonough, E. W. Heffernon and M. Patterson.—p. 928.

Treatment of Tension Headache. R. F. Grenfell.—p. 933.

Chloromycetin (Chloramphenicol) in Treatment of Pneumococcic Pneumonia and Miscellaneous Infections. B. E. Gilpin and L. C. Rohrs. —p. 937.

*New Cation Exchange Resin in Therapy of Edematous States. D. W. Chapman, F. C. Pannill Jr., and R. H. Skaggs.—p. 945.

Actinomycosis: Report of Four Cases and Brief Review of Literature. E. Wasserman.—p. 951.

Current Concepts of Climacterium. M. Ross.—p. 955.

Instructive Diagnostic Errors. A. Kahn and J. S. Griffin.—p. 959.

Physical Treatment and Rehabilitation of Hemiplegic Patient in General Practice. O. F. Von Werssowetz.—p. 963.

Chronic Relapsing Pancreatitis.—Chronic relapsing pancreatitis has become firmly established as a disease entity with characteristic clinical manifestations and pathological findings. Pain is the most consistent presenting symptom, located anywhere in the abdomen, but most commonly in the epigastrium with radiation to the back and left flank. Microscopically, fibrosis and fibroplastic proliferation predominate, often to the extent that the normal lobular arrangement of the gland is obliterated. The pathogenesis of chronic relapsing pancreatitis is far from clear except for the fairly well-established fact that some degree of obstruction to the flow of pancreatic juice is responsible for de-

velopment of this morbid process. Diagnosis remains difficult because the severity and frequency of the attacks are unpredictable and cumulative pancreatic damage is variable. Severe abdominal pain contrasted with minimal physicial signs is the most helpful diagnostic criterion. The diagnostic help from laboratory tests depends on the stage of the disease. During a painful relapse, nonspecific leukocytosis and an increase in the sedimentation rate are usually found. More specific findings are an elevated serum amylase and lipase level and glycosuria or hyperglycemia. Between attacks of pain the tests used to detect subclinical diabetes should be carried out, but they will be negative unless extensive pancreatic damage has already developed. Roentgenographic demonstration of calcification in the pancreas is the one pathognomonic sign of chronic relapsing pancreatitis and the correct diagnosis often is made during roentgenologic study of adjacent organs. Tests of pancreatic function are of very limited diagnostic value. Both medical and surgical treatment is unsatisfactory. During the painful episodes antispasmodics should be tried for their possible effect in relaxing the sphincter of Oddi and suppressing pancreatic secretion. When it is obvious that these drugs do not control the pain sufficiently, narcotics in therapeutic doses must be administered. Surgical therapy should be instituted before narcotic addiction is fixed. Surgical procedures include those carried out on the pancreas itself, those designed to affect the disease process in the pancreas indirectly, and those that interrupt pain transmission from the pancreas.

New Cation-Exchange Resin.—Thirty-two patients with various edematous states were treated with a carboxylic acid resin. The first 12 were given 10 gm. of the acid resin and 5 gm. of the potassium salt of the resin three times daily before meals for 5 to 38 days. The remaining 20 patients were given 12 gm. of a mixture consisting of 5 parts carboxylic acid resin, 2.5 parts potassium resin, and 1 part anion exchange resin four times daily, before meals and at bedtime, for 7 to 50 days. All patients in the first group were hospitalized and the first 11 patients of the second group were hospitalized. The remaining nine were outpatients. All patients received a diet containing 6 gm. of sodium chloride (approximately 100 mEq. of sodium). The resins were easily suspended in liquids by rapid stirring and were taken quite readily. With two exceptions, no gastrointestinal symptoms were reported by any patient. No symptoms suggestive of rapid sodium depletion were observed. Loss of body weight varied from 3 to 33 lbs. (1.3 to 15 kg.). A prolonged QT interval was noted in only one patient and was thought to be due to the primary disease process. All patients commented on the increased palatibility of their food as compared to low sodium or low salt diets. One instance of pronounced lowering of the carbon dioxide combining power was noted, but when resin therapy was discontinued for one week and then reinstituted at one-half the previous dose level, normal carbon dioxide combining power was restored. It is thought that the chief use of carboxylic acid-potassium-anion resin mixture will be in retaining dietary sodium within the lumen of the bowel to be excreted in the stool. Thus it will allow more liberal dietary management of patients for whom sodium restriction is thought necessary. It is not designed to take the place of digitalis or mercurial diuretics when these agents are indicated for proper management of the patient, but mercurial requirement may be decreased sharply during resin therapy. Excessive loss of potassium is avoided by use of a potassium resin, and the addition of a small amount of an anion exchanger reduces the hazard of acidosis. The resins are contraindicated in patients with impaired renal function. Results showed that the optimum dose is 48 gm. daily with a 6 gm. sodium chloride diet, but this is subject to individual variation. Laboratory control should include determinations of carbon dioxide, chloride, and urea nitrogen in the serum and sodium chloride in the urine, as well as routine urinalyses.

Bulletin New York Academy of Medicine, New York

27:643-690 (Nov.) 1951

Mechanism and Management of Circulatory Failure. W. Dock.—p. 645.
Surgical Treatment of Parkinsonism: Indications and Results. J. Ebin. —p. 653.
Body Water in Man and Its Subdivisions. J. M. Steele.—p. 679.

California Medicine, San Francisco

75:321-384 (Nov.) 1951

Treatment of Craniocerebral Injuries and Prevention of Anoxia. J. E. Adams.—p. 321.
Topical and Systemic Use of Cortisone in Dermatology. B. A. Newman and F. F. Feldman.—p. 324.
Current Concepts of Primary Dysmenorrhea. M. Ross.—p. 332.
Role of Connective Tissue Ground Substances (Mucopolysaccharides) in . Allergic Injury. J. F. Rinehart.—p. 335.
Intensive X-Ray Survey for Tuberculosis in Rural County. W. R. Oechsli, H. Cohn, C. R. Kroeger and A. A. Adames.—p. 341.
Surgical Principles of Incising Renal Parenchyma. G. L. Torassa.—p. 345.
Adenotonsillectomy: Indications and Application of Surgical Techniques. E. Leivers.—p. 351.
Radiation Therapy in Breast Cancer: Preliminary Report on Application of Technique of McWhirter Type. E. A. Lodmell and P. R. Brady. —p. 354.
Pros and Cons of Routine Circumcision. D. Hovsepian.—p. 359.
Colles' Fracture: Method of Maintaining Reduction. L. Cozen.—p. 362.
Eosinophilic Pneumonia (Loeffler's Syndrome): Report of Case Treated with ACTH. E. R. Riggall and J. J. McGinnis.—p. 365.
Erythema Nodosum: Treatment with Cortisone by Mouth. R. W. Albright and M. J. Kuffel.—p. 368.
Waterhouse-Friderichsen Syndrome: Recovery of Patient Treated with Cortisone. J. T. Fowler Jr.—p. 369.

Indiana State Medical Assn. Journal, Indianapolis

44:1057-1144 (Nov.) 1951

The Doctor's Place in the Sun. A. Ellison.—p. 1089.
Testicular Tumors with Seven Case Presentations. C. J. Van Tassel Jr. —p. 1092.
Case of Waterhouse-Friderichsen Syndrome Due to Hemophilus Influenzae. A. J. Kahn and R. M. Butler.—p. 1098.
Analysis of Present-Day Surgical Treatment of Peptic Ulcer. C. A. Wiethoff.—p. 1101.
Clinical Evaluation of Surital Sodium, New Intravenous Barbiturate: Report of 1000 Cases. P. A. Littlefield, V. K. Stoelting and J. P. Graf. —p. 1105.

Kentucky Medical Journal, Bowling Green

49:429-478 (Oct.) 1951

Prevention of Eclampsia. R. A. Orr.—p. 429.
Psychosomatic Conditions Observed in 1,000 Consecutive Office Patients. W. O. Johnson.—p. 432.
Summertime Medical Emergencies. O. J. Hurt.—p. 439.
Approach to Problem of Gastric Ulcer or Gastric Cancer. J. E. Hix. —p. 442.
Practical Aspects of Chronic Prostatitis. D. E. Scott.—p. 445.
Abdominal Trauma. R. W. Robertson.—p. 450.

49:479-530 (Nov.) 1951

Review of 2,000 Vaginal Deliveries Under Low Spinal Anesthesia. W. G. Caldwell.—p. 479.
Pulmonary Resection for Carcinoma and Inflammatory Disease of Lung. R. R. Crutcher.—p. 483.
Ear Pain and Its Relation to Costen's Syndrome. A. C. Poweleit.—p. 494.
Acute Appendicitis. J. D. Hancock.—p. 497.
Experiences with Acute Rheumatic Fever Over a Five Year Period. J. A. Little and C. Sullivan.—p. 500.

Neurology, Minneapolis

1:419-496 (Nov.-Dec.) 1951

Gliomas Involving Splenium of Corpus Callosum. B. Schlesinger.—p. 419.
Failures in Migraine Therapy. A. P. Friedman and T. J. C. von Storch. —p. 438.
Neuropharmacologic Considerations in Psychic Seizures. J. E. P. Toman. —p. 444.
*Second Attacks of Acute Anterior Poliomyelitis. A. T. Coffee and W. D. Paul.—p. 461.
Aphasia: Effect of Intravenous Sodium Amytal. P. S. Bergman and M. Green.—p. 471.

Second Attacks of Poliomyelitis.—Patients have been observed who, during the convalescent phase of poliomyelitis, had a recurrence of acute systemic symptoms, in conjunction with an extension of paralysis to myotomes previously unaffected. This situation has been noted weeks, and sometimes months, after the initial phase of the disease. Since man is known to harbor the poliomyelitis virus in his nasopharyngeal secretions and/or gastrointestinal tract as a convalescent carrier for many months following the acute phase of the disease, progression or development of additional paralysis during a period of three or four months after the initial infection is considered a recrudes-

cence of the original infection, whereas those appearing two or more years later are designated as a re-infection. Coffee and Paul add one case of their own observation to 49 previously recorded cases of second attacks of poliomyelitis. The case reported here represents an instance of two distinct attacks, separated by an interval of 24 years. Factors responsible for the occurrence of second attacks of poliomyelitis are as yet little understood, but the authors mention several possible explanations such as antigenically different strains of poliomyelitis virus, inability of some patients to produce antibodies, and loss of immunity in the course of time. A combination of such factors may be present in an individual case.

New England Journal of Medicine, Boston

245:629-670 (Oct. 25) 1951

*Use of Propylthiouracil in Hyperthyroidism and Diabetes: Study of 41 Cases. B. D. Bowen and A. R. Lenzner.—p. 629.
Congenital Syphilis in Massachusetts. N. J. Fiumara.—p. 634.
Aerobic Actinomyces Septicemia: Report of Case. P. M. Kohn, M. Tager, M. L. Siegel and R. Ashe.—p. 640.
"Wetherbee Ail": Inheritance of Progressive Muscular Atrophy as Dominant Trait in Two New England Families. M. R. Brown.—p. 645.
Diseases of Muscles. H. R. Viets and M. R. Brown.—p. 647.

Propylthiouracil in Hyperthyroidism Associated with Diabetes.—The effectiveness of propylthiouracil in diagnosis and in temporary and permanent control of hyperthyroidism was tested on 41 hyperthyroid diabetics. Hyperplastic hyperthyroidism was present in 11 patients whose average age was 48 years and of whom 6 had a family history of diabetes. Adenomatous hyperthyroidism was present in 29 patients whose average age was 60 years, of whom 12 had a family history of diabetes. One patient had Riedel's struma. When hyperthyroidism preceded diabetes the syndrome was probably a result of multiple hormone action, rapid carbohydrate absorption, and increased caloric intake. When diabetes preceded hyperthyroidism varying degrees of obesity prevailed, associated with a chronic, varying demand for increased calories, especially in patients with adenomatous hyperthyroidism. The most helpful clinical indication of the hyperthyroid state was failure to gain weight after diabetes had been controlled, despite an adequate diet. The average maintenance dose of propylthiouracil for patients with primary hyperthyroidism was 350 mg. daily. Five patients required 600 mg. or more. The average maintenance dose for patients with adenomatous hyperthyroidism was 300 mg. daily. Eight patients required 400 mg. or more. Complete remission of hyperthyroidism for more than one year occurred in four patients. Relapse recurred in two patients to whom propylthiouracil had not been given for several months. Nodules appeared or those already present became enlarged in several patients because of the duration of the treatment. Transitory granulocytopenia, urticaria, and acute thyroiditis either consequent to, or coincident with the therapy, occurred in one patient respectively. No change was observed in the caloric requirement after thyroidectomy as compared with that of the drug-controlled hyperthyroid state prior to operation. Likewise, the insulin requirement before and after operation did not change.

North Carolina Medical Journal, Winston-Salem

12:481-524 (Oct.) 1951

Conservation of Our Aging Population. C. Tibbitts.—p. 481.
Carbon Dioxide Therapy. G. A. Silver.—p. 486.
*Subacute Bacterial Endocarditis: Clinical and Bacteriologic Correlation in Stubborn Case Cured with Massive Chemotherapy. M. P. Tyor, H. L. Izlar Jr. and G. T. Harrell.—p. 488.
*Diagnosis of Mumps Meningoencephalitis. G. E. Prince.—p. 495.
Management of Stasis Dermatitis and Stasis Ulcer. W. T. Watkins Jr.—p. 499.
Clinical Experience with Surital Sodium in Anesthesia. C. R. Stephen and R. Martin.—p. 501.
Clinical Impressions Gleaned from Use of New Intravenous Anesthetic, Surital Sodium. R. L. Wall.—p. 505.
Experience with Male North American Frog Test. W. M. Smethie.—p. 507.

Subacute Bacterial Endocarditis.—Tyor and associates call attention to the drug fastness that develops as the result of treating minor symptoms with chemotherapeutic agents. In vitro sensitivity tests and blood levels serve as a rough guide to therapy. Drug-fastness to penicillin, and probably to aureomycin and chloramphenicol, is a relative phenomenon and may be overcome by massive or combined chemotherapy. In a stubborn and protracted case of subacute bacterial endocarditis, eventual cure was produced by massive doses of penicillin after aureomycin, chloramphenicol, streptomycin, and sulfadiazine, singly or in combination with penicillin, had failed. A total of 1,051,000,000 units of penicillin, 164 gm. of chloramphenicol, 36 gm. of dihydrostreptomycin, 130 gm. of sulfadiazine, and 124 gm. of aureomycin was given to this patient during her illness. In a disease that tends to produce serious damage to the myocardium, kidneys, and central nervous system, vigorous treatment with specific chemotherapy and with supportive measures should be instituted as early as possible, revised as complications arise, and continued until cure is assured. The leukocyte count, erythrocyte count, sedimentation rate, and temperature curve may all be misleading in determining activity of the infection; in the case reported here the symptoms proved the best prognostic guide. Embolic episodes that occur during clinical and bacteriologic remission do not necessarily alter the prognosis or the ultimate outcome. The development of potent chemotherapeutic agents has resulted in the appearance of a new syndrome—healed bacterial endocarditis. As the damaged heart valve is repaired the scar tissue contracts, increasing the valvular defect. More and more patients are now dying from cardiovascular or renal failure weeks to months after bacteriologic cure of the infection has been produced.

Diagnosis of Mumps Meningoencephalitis.—Five patients believed to have mumps meningoencephalitis without parotitis are described. All five patients gave a history of exposure to mumps parotitis two or three weeks before the onset of meningoencephalitis. None had evidence of parotitis at the time of first examination, but one patient had a history of parotitis one week previously, and another patient developed bilateral parotid swelling the day after admission. All patients had fever and vomited. Four patients complained of severe headache, and the other patient was an infant who screamed and rolled his head as if in pain. Only two patients had stiffness of the neck, but none was able to lean forward and place his forehead on his knees. These patients resembled children with early poliomyelitis except for the absence of muscle tenderness. Only one patient appeared to be seriously ill. A history of exposure to mumps, with the development of lethargy, headache, vomiting, and nuchal rigidity in a patient whose spinal fluid contains a high leukocyte count, of which at least 90% are mononuclear cells, strongly suggests the presence of mumps meningoencephalitis. The spinal fluid white cell count often exceeds 200 per cubic millimeter, and the protein content of the fluid may be elevated. The spinal fluid changes are suggestive, but not conclusive. However, a correct diagnosis can be established by physicians in even the smallest communities if they will obtain serum in the acute and convalescent periods and send it to one of the communicable disease centers for mumps complement-fixation tests.

Tennessee State Medical Assn. Journal, Nashville

44:405-450 (Oct.) 1951

Importance of Hoarseness. W. G. Kennon Jr.—p. 405.
Mesotheliomas of Pleura and Peritoneum. A. P. Stout.—p. 409.
Infectious Mononucleosis or a New Entity? R. C. Kimbrough Jr.—p. 412.
Total Gastrectomy. W. T. Tyson.—p. 419.

44:451-492 (Nov.) 1951

SYMPOSIUM ON HEART DISEASE

Heart Disease—Classification and Cause. L. A. Grossman.—p. 451.
The Cardiac Arrythmias. D. Strayhorn.—p. 455.
Modern Concepts in Diagnosis and Treatment of Congestive Heart Failure. S. S. Riven.—p. 460.
Laboratory Aids to Diagnosis in Heart Disease. T. M. Blake.—p. 466.
Ocular Changes in Orbital Cellulitis. O. E. Ballou.—p. 470.

Texas State Journal of Medicine, Fort Worth

47:735-798 (Nov.) 1951

Congenital Lesions of Alimentary Tract in Infants and Children: Personal Cases of Surgical Interest. R. J. White.—p. 740.
Precancerous Lesions of Gastrointestinal Tract. G. M. Underwood.—p. 744.
Esophageal Hiatus Hernia in Older Persons. G. F. Madding and F. M. Spencer.—p. 748.
Roentgenologic Examination of Small Intestine. C. A. Good.—p. 753.
Duodenal Ulcers: Place of Surgical Treatment. G. G. Finney.—p. 756.
Operative Management of Cancer of Colon and Rectum. R. J. Rowe.—p. 760.
Recent Advances in Proctology. J. McGivney.—p. 770.

FOREIGN

Acta Medica Scandinavica, Stockholm

140:317-394 (Sept. 24) 1951. **Partial Index**

Medical Studies in North Greenland 1948-1949: III. Allergic Diseases and Pulmonary Emphysema. M. C. Ehrström.—p. 317.
Id.: IV. Enlargement of Liver. Biliary Stone and Peptic Ulcer. Incidence and Etiology. M. C. Ehrström.—p. 324.
*Late Results of Gastric Resection for Gastro-Duodenal Ulcer: Follow-Up Study with Special Reference to Serious Late Complications, Subjective Symptoms and Anemia. A. Drablös, V. Lindén and P. Skjelbred. —p. 327.
*Anticoagulants in Treatment of Coronary Thrombosis. C. Holten.—p. 340.
Pathogenetic Problems in "Acute Leukemic Conditions." N. G. Nordenson.—p. 349.

Gastric Resection for Gastroduodenal Ulcer.—Of 492 patients with peptic ulcer subjected to gastric resection during 1937-1946, 14 died immediately after the operation, an operative mortality rate of 2.8%. Of 30 patients who died from six months to four years after the operation, the cause of the death was known for 22: three died of gastrointestinal hemorrhage, three of gastrocolic fistula, and one of stenosis of the anastomosis. Thus seven patients died of gastric disease or of postoperative complications, a late mortality rate of about 2%. Of the remaining 448 patients, 313 (278 men and 35 women) were reexamined in 1950. Of these, 13 (4.2%) had serious complications referable to the gastrointestinal tract. The number of late deaths and late complications, therefore, was greater than those of earlier investigations. Eighteen patients (5.8%) complained of severe dyspepsia. Signs of collapse with prostration, cold sweating, and giddiness occurred immediately after meals in 14 patients (4.5%), and hypoglycemic symptoms were observed in 10 patients (3.2%). Anemia was found in 74 men (26.6%) and 14 women (41.2%). The criterion of anemia for men was a hemoglobin value below 13.26 gm. per 100 cc., and for women a value below 11.64 gm. per 100 cc. Of the 313 patients, 145 (46.6%), had no symptoms. Since operative deaths, late deaths, and serious postoperative disturbances occurred in about 20% of the patients, satisfactory results were obtained in about 80%.

Anticoagulants in Treatment of Coronary Thrombosis.—Of 430 patients with acute coronary occlusion, 174 were given anticoagulant treatment with heparin for 24 hours, and with bishydroxycoumarin (dicumarol®) for three weeks. The bishydroxycoumarin dosage was based on frequent determinations of the prothrombin time; the aim was to reduce prothrombin activity to about 30% of normal. Of the 174 patients, 39 (22.5%) died. Of 256 control patients who were not given anticoagulant treatment, 92 (36%) died. This is a significant difference, and the two groups were comparable. With some inadvertent exceptions patients admitted on even days were given anticoagulant treatment, and those admitted on odd days were not. In no case did the apparent severity of the condition or any other circumstance determine whether anticoagulant treatment should be given or omitted. A comparison of the two groups with regard to mortality rate and age showed that the mortality rates in both groups were highest in the patients between 60 and 69 years (17% deaths in the group with anticoagulant treatment, and 43% in the control group). Deaths occurred from the second to ninth day after admisison in 19.5% of the control patients, but in only 11.5% of the treated patients. This significant difference suggested that the effect of the treatment was not entirely due to a reduction of thromboembolic complications, since these complications occur about one week or more after the coronary occlusion. Thromboembolic complications were reduced by anticoagulant treatment from 14% in the control group to 4% in the treated group; those occurring in the treated patients seemed to be less severe than in the control group. Anticoagulant treatment seemed to improve the prognosis significantly in patients who had had earlier attacks of coronary occlusion: of 25 treated patients, 5 (20%) died, while of 32 control patients, 15 (47%) died. The higher death rate in both control and treated patients than in two similar groups reported on by American investigators is due to the fact that the attacks of coronary thrombosis were considered severe in the majority of the Danish patients, but in only one-third or one-fourth of the American patients.

British Heart Journal, London

13:421-584 (Oct.) 1951. **Partial Index**

The Ancient Art of Feeling the Pulse. D. E. Bedford.—p. 423.
Visible Pulsation in Relation to Blood Flow and Pressure in Pulmonary Artery. M. Campbell.—p. 438.
Effect of Deep Inbreathing on Lead III of Electrocardiogram. W. Evans. —p. 457.
*Prevention of Impending Cardiac Infarction by Anticoagulant Treatment. K. S. Smith and C. Papp.—p. 467.
Oesophageal and Other Leads in Posterior Cardiac Infarction. S. Oram, M. Holt and T. East.—p. 475.
The Oesophageal Lead. C. W. C. Bain.—p. 485.
Significance of Notched Upright T Waves. W. Dressler, H. Roesler and H. Lackner.—p. 496.
Radiology of Acute Pulmonary Oedema. F. Jackson.—p. 503.
Pulmonary Stenosis with Normal Aortic Root. D. G. Abrahams and P. Wood.—p. 519.
Methods for Measuring Resistance at Any Point on Body and for Equalizing Inequalities of Skin Resistance. E. Goldberger.—p. 549.
Insidious Thrombosis of Abdominal Aorta. J. F. Goodwin and E. Petrie. —p. 554.
Systolic Murmurs in 525 Healthy Young Adults. I. M. G. Stewart. —p. 561.

Anticoagulants to Prevent Cardiac Infarction.—While cardiac infarction often comes on without warning, it is sometimes heralded by a prodromal syndrome in which anginal attacks alter their pattern and become worse. The observations of some authors support the concept that a gradually decreasing coronary lumen with increasing myocardial ischemia terminates in infarction and that the fatality rate is lower among patients who show prodromal symptoms than among those who do not. Smith and Papp review the use of anticoagulants in patients with premonitory symptoms to prevent cardiac infarction and give an account of 14 such patients whom they treated with heparin and bishydroxycoumarin (dicumarol®). In seven instances such treatment coincided with progressive improvement, in six no infarction developed, and in the seventh the ensuing infarct was slight although previous infarctions had been severe. From the first few days of treatment the pain that had been increasing in spite of rest and other medicaments gradually diminished and finally disappeared. In the other seven patients, cardiac infarction developed in spite of treatment. Three of this group died, and necropsy in two of them showed extremely advanced coronary sclerosis and ischemia involving a large part of the myocardium. In one of these patients an electrocardiogram before infarction showed only minimal abnormalities representing subendocardial ischemia in spite of widespread coronary arterial narrowing. This may explain the failure of preventive treatment in some patients who have normal or almost normal electrocardiograms.

British Journal of Radiology, London

24:525-580 (Oct.) 1951. **Partial Index**

Some Problems of Radiation Protection. W. V. Mayneord.—p. 525.
Radiological Diagnosis of Salivary Gland Disease. R. G. W. Ollerenshaw and S. S. Rose.—p. 538.
Cleidocranial Dysostosis. W. R. Cole and S. Levin.—p. 549.
Observations upon Lymphopenia of X-Ray Irradiation: Part II. C. H. G. Price.—p. 556.
*Use of Lead Shot for Protection from Gamma Radiation. A. Nightingale. —p. 568.

Lead Shot for Protection from Gamma Radiation.—Protection from gamma rays is usually obtained by surrounding the source with an appropriate thickness of lead. The lead is cast in the form of interlocking bricks, and these are built up into a wall around the radioactive material. If, however, the source is to be placed inside a complex apparatus, e. g., inside the absorption cell in a spectrophotometer, a wall of standard-sized lead bricks cannot always be located to give convenient access to adjustment controls without loss of protection. To overcome these difficulties, continuous "cavity walls" filled with small lead shot have been used. A number of investigations were undertaken to ensure that this use of lead shot does provide adequate protection, and the experiments are described in this paper. It was proved that cavity walls filled with small lead shot may safely be used instead of solid lead for protection against gamma rays, at least in thicknesses greater than 1.4 in. They are not suitable for shielding fixed objects such as photographic material. The diameter of the lead shot should not be greater than the effective diameter of the source.

British Medical Journal, London

2:1041-1102 (Nov. 3) 1951

Problems Involved in Homotransplantation of Tissues, with Particular Reference to Skin. W. J. Dempster.—p. 1041.
Effect of Locally Applied Cortisone Acetate on Survival of Skin Homografts in Rabbits. R. E. Billingham, P. L. Krohn and P. B. Medawar.—p. 1049.
Transient Disturbances of Consciousness in Hepatic Cirrhosis. A. G. W. Whitfield and W. M. Arnott.—p. 1054.
Value of Histamine Skin Tests in Ménière's Disease. M. Haggie.—p. 1057.
*Erysipeloid of Rosenbach. J. E. L. Price and W. E. J. Bennett.—p. 1060.
*Bacteriology of Erysipeloid. P. H. A. Sneath, J. D. Abbott and A. C. Cunliffe.—p. 1063.
Intrathecal Chloramphenicol in Staphylococcal Meningitis Resistant to Penicillin and Streptomycin. K. F. Anderson and F. G. Ellis.—p. 1067.

Erysipeloid of Rosenbach.—The apparent rarity of infection with the erysipeloid of Rosenbach may be due to frequent misdiagnosis. Physicians practicing near meat and fish markets, slaughterhouses, and hotel districts are familiar with the disease and regard it as not uncommon. The diagnosis usually depends on the presence of a typical clinical picture. The patient complains of pain and swelling of a finger or part of a hand. The pain is often severe, is made worse by the application of heat, and is described as throbbing or burning. A history may be elicited of a scratch or puncture of the affected part by a meat bone, fish bone, fish skin, or butcher's knife as long as two weeks before the onset of symptoms, but often no history of trauma is obtainable. Erysipeloid is a self-limiting condition, subject to spontaneous remission and ultimate resolution without suppuration, and the physical signs are usually present for three to four weeks. Incision of the infected area benefits neither symptoms nor progress, and may result in secondary infection. Two series of cases are reviewed. In one group of 31 cases penicillin was given systemically, usually in doses of 250,000 units twice daily for one to four days. After this time the patients usually discontinued taking the drug, presumably because their symptoms had subsided. Six patients had relapses three to eight days after penicillin administration had ceased. Further penicillin was given for two or three days. Only three patients other than these required treatment for more than four days. In the second series of 20 cases a biopsy was taken immediately after the clinical diagnosis had been made. Erysipelothrix rhusiopathiae was cultivated in only 7 of the 20 cases. Three cases of the 13 that failed to yield the Erysipelothrix received some penicillin before biopsy was performed. Nearly half of the 20 patients were symptom-free in 6 days and nearly three-fourths in 12 days after treatment with penicillin.

Bacteriology of Erysipeloid.—The authors of this paper examined in detail the seven strains of Erysipelothrix rhusiopathiae isolated from the patients with erysipeloid mentioned in the preceding paper. All the strains were culturally and biochemically homogeneous and indistinguishable from veterinary strains. They were distributed among several antigenic groups, and were relatively uniform in their sensitivity to various antibiotics. They were most sensitive to pencillin, aureomycin, and chloramphenicol.

Canadian Journal of Public Health, Toronto

42:351-396 (Sept.) 1951. **Partial Index**

Bacteriophage Typing in Investigations of Staphylococcal Food-Poisoning Outbreaks. M. Saint-Martin, G. Charest and J. M. Desranleau.—p. 351.
Cancer Mortality Trends Versus Clinical Claims of Cure. N. E. McKinnon.—p. 359.
*Influenza Virus Epidemic in Canada During January-February, 1951. F. P. Nagler, M. M. Burr and A. L. Gillen.—p. 367.
Objective Mortality Indicator. R. Kohn.—p. 375.
Tetanus Antitoxin Titres Following Recall Dose of Tetanus Toxoid: Three-Year Study. F. O. Wishart and L. K. Jackson.—p. 384.

Influenza Epidemic.—The Canadian influenza epidemic of January and February, 1951, started at Grand Falls, Newfoundland, which is about 40 miles east of Gander, the Trans-Atlantic Airport. Therefore, the infective agent could have been brought into Canada by air. Within two weeks, about 700 cases were reported in Newfoundland. Epidemics developed in other provinces in quick succession, and the epidemic reached its peak in the third week of February. Laboratory investigations were carried out by the Canadian Influenza Center. Insulated shipping containers had been forwarded to provincial public health laboratories for collection and transportation of representative samples of throat washings and paired serums. Influenza virus was isolated by amniotic inoculation of chick embryos from 60% of a total of 60 throat washings tested. The isolated strains, all of which proved to be identical, were readily adapted to the egg and early amniotic passages showed evidence of O and intermediate phases. The virus proved nonpathogenic to mice on mouse-lung passage. A significant increase in antibody titer was demonstrated in 82% of the 200 paired serums tested. The complement-fixation test was the most efficient diagnostic procedure, showing a significant antibody increase in about 77% of the cases. The hemagglutination-inhibition test demonstrated such a rise in 71% with standard strains and in only 61% with the isolated strains. The antibody response in humans and the inhibition of the strains by FM1 strain antiserum indicated that the isolated strains were of the A-prime type. Antiserum prepared against one of these strains revealed a close relationship to a strain isolated in Sweden in 1950 and one isolated in England early in 1951.

Hoja Tisiológica, Montevideo

11:191-288 (Sept.) 1951. **Partial Index**

*Antibiotics in Treatment of Pulmonary Tuberculosis. R. E. Marín Pittaluga and A. Rodríguez.—p. 194.
*Pneumothorax in Newborn Infants: Case. B. Delgado Correa and J. C. Barani.—p. 239.

Streptomycin in Pulmonary Tuberculosis.—Streptomycin was administered to 337 patients with chronic pulmonary tuberculosis. The drug was given in daily doses of 500 mg. up to a total dose of 50 gm. in one or two courses with an interval between the first and second courses. Good results were obtained in 189 patients (56.08%), as shown by increase in weight, control of symptoms, improvement in the hematologic picture, and roentgenographic regression of the pulmonary lesions. In the group of patients who improved, the pulmonary lesions consisted of infiltration alone in 77 cases, infiltration and small cavities in 54, one or more large cavities in 18, nodules in 23, exudation and fibrosis in 12, and pleuritis in five patients. Associated extrapulmonary tuberculosis was observed in 76 of the 337 patients. The extrapulmonary lesions were improved by streptomycin therapy in 22 of 32 cases of laryngeal tuberculosis, 11 of 19 cases of bronchial tuberculosis, 3 of 5 cases of intestinal tuberculosis, 2 of 4 cases with lymph node involvement, 2 cases each of adnexal and renal tuberculosis, and 1 each of vaginal tuberculosis, tuberculous endometritis, erythema nodosum, scrofulous keratitis, and perianal fistula. There was no improvement in five cases of tuberculosis of the bone, one case of tuberculosis of the breast, and one case of tuberculous otitis media. Streptomycin was well tolerated. In all cases it diminished the size and acuteness of the pulmonary lesion, and made the patient a better prospect for collapse therapy. Administration of streptomycin did not prevent development of tuberculous meningitis, fistula following thoracoplasty, and extrapleural empyema after pneumothorax. Streptomycin is not indicated in treatment of benign forms of tuberculosis, because of the danger of eliciting streptomycin resistance of tubercle bacilli.

Pneumothorax in Newborn Infants.—Pneumothorax may cause the death of a newborn infant without a diagnosis. It may occur in premature as well as in full term infants. Trauma, violent artificial respiration, and oxygen insufflation without control of oxygen pressure are the causal factors. Dyspnea and cyanosis are characteristic symptoms. Shock may follow rapidly. The diagnosis should be suspected in the presence of these symptoms associated with rales in the base and middle zone of the lung. The diagnosis is confirmed immediately by radioscopy and roentgen examination of the chest (front and profile views). Treatment of this emergency consists of immediate puncture of the thorax with slow withdrawal of air from the pleural space. A case responding favorably to this treatment is reported.

Journal of Laryngology and Otology, London

65:681-748 (Oct.) 1951

Introduction to Study of Comparative Anatomy of Labyrinth. O. Gray.—p. 681.
Exostosis of External Auditory Meatus. D. F. N. Harrison.—p. 704.
Adamantinomas in Relation to the Nose. Ahmad Bey Handousa.—p. 715.
Laryngoceles. S. Horowitz.—p. 724.

BOOK REVIEWS

Endoscopy as Related to Diseases of the Bronchus, Esophagus, Stomach, and Peritoneal Cavity. By Edward B. Benedict, A.B., M.D., F.A.C.S., Assistant Clinical Professor of Surgery, Harvard Medical School, Boston. Cloth. $10. Pp. 373, with 142 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

Although each section contains descriptions of instruments and techniques, the book is primarily concerned with the etiology, symptomatology, pathology, and general diagnostic aspects of the diseases of importance to the endoscopist in the fields mentioned. The indications and contraindications for the endoscopic procedures in each condition are noted, and the endoscopic pathology and treatment described. The book is profusely illustrated with roentgenograms, photographs and drawings of instruments and techniques, and color plates of endoscopic views. Each chapter contains an excellent bibliography. The author's qualifications to undertake a book of this type are well known in medicine and surgery through his previous contributions to the literature of the four fields covered. The broad approach to both the major subjects and the specific disease entities makes this book one that the general surgeon, internist, pediatrician, otolaryngologist, and roentgenologist will wish to read. The author clearly demonstrates that as a specialty endoscopy cannot be limited to the view obtained through the endoscope itself, though this is an important part of the understanding of the patient and his disease. The general subject matter of the book is clearly presented, with brief, concise descriptions of disease entities; the format, type, and illustrations are excellent.

Bacterial and Virus Diseases: Antisera, Toxoids, Vaccines and Tuberculins in Prophylaxis and Treatment. By H. J. Parish, M.D., F.R.C.P.E., D.P.H., Clinical Research Director, Wellcome Foundation, Ltd., London, Second edition. Cloth. $2.50. Pp. 204, with illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

One might readily have the impression while reading this book that it was written before the advent of the sulfonamides and antibiotics; yet the original work appeared as late as 1948. It does not describe disease; instead, it discusses prevention and treatment. There is considerable discussion concerning the preparation and usage of a number of biological products, which are either practically unavailable or rarely used. Nevertheless, there is a great deal of condensed information about immunity and procedures for immunization against the bacterial and virus diseases. The final chapter, which deals with historical aspect, contains a series of dates briefly annotated by references to important discoveries and developments in the field of immunity and immunization. Preceding the index at the end of the book are suggestions for further reading. There are six pages of colored plates, three depicting skin tests and the others various organisms. The paper and print are excellent, and the volume is convenient in size. This book is of value as a handy reference aid for both medical students and those particularly interested in acute infectious diseases.

Review of Physiological Chemistry. By Harold A. Harper, Ph.D., Professor of Biology (Biochemistry), University of San Francisco, San Francisco. Third edition. Paper, loose-leaf. $3.50. Pp. 260, with 13 illustrations. University Medical Publishers, P. O. Box 761, Palo Alto, California, 1951.

Dr. Harper covers the fundamental, noncontroversial parts of physiological chemistry, in this work for medical students to use along with standard texts and physicians to use in studying for state and specialty boards. The subject matter is up-to-date, and its arrangement is logical and clear. Diagrams, structural formulas, and charts are liberally used, and the index is adequate. There is some laxity in the definitions and nomenclature, e. g., on page 30, "The term 'lipids' is a general name for a group of hydrocarbons [sic] of fatty nature. . . ."

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

The Child Guidance Approach to Juvenile Delinquency. By Eugene Davidoff and Elinor S. Noetzel. Cloth. $4.50. Pp. 173. Child Care Publications, 30 West 58th St., New York 19, 1951.

The authors' experiences in the outpatient department of a psychopathic hospital and the general conclusions drawn from their experiences are described in this volume. The period of activity covers the years 1936 to 1942; some chapters of the book have already appeared in technical publications. Perhaps the most important contributions are the specific and detailed directions regarding the medical, psychological, and social handling of juvenile delinquents. There is helpful guidance on organization of child guidance clinics, as well as recommendations regarding the functions of the psychiatrist, psychologist, and social worker and their interrelationships. Extensive consideration is given to various forms of juvenile conduct disorders and their management. An especially interesting chapter describes a detailed follow-up of 374 hospital admissions, with tabulations of adjustments made over a 14 year period. This volume should be of interest to all workers in this field.

Patient's Doing Fine! Know Your Doctor and Your Hospital. By David M. Dorin. Cloth. $2.50. Pp. 122. Vantage Press, Inc., 230 W. 41st St., New York 18, 1951.

Mr. Dorin has been able to observe the reactions of both physicians and patients to illness. To ease the patient's fear of hospitalization, he explains the mechanism of the hospital, the services it provides, its interest in the public, its relationship to the physician, and other aspects that are usually known only to the staff. He discusses the problem of hospital guests, general information to patients on what is to be expected of them, the house physician, the food problem, and many other aspects of hospitalization. This is a very suitable book for the patient, as it gives him a better understanding of the problems that physicians and hospitals encounter in helping patients overcome their illnesses and injuries. Medical societies would do well to place this book in the libraries of the high schools and colleges within their service area, for, through reading it, the layman can arrive at a better understanding of the problems of medical and hospital care.

The Chemistry and Technology of Food and Food Products in Three Volumes. Volume II. Prepared by group of specialists under editorship of Morris B. Jacobs, Ph.D., Adjunct Professor of Chemical Engineering, Polytechnic Institute of Brooklyn, New York. Second edition. Cloth. $15. Pp. 835-1769, with illustrations. Interscience Publishers, Inc., 250 Fifth Ave., New York 1; 2a Southampton Row, London, W.C.1, 1951.

This book describes particular food groups, such as dairy products, meat products, cereals, bakery products, confections, spices, and condiments. Their history, statistics, definitions, standards, composition, and chemistry are discussed in some detail. There is a very liberal use of references; for instance, the chapter on fruits and nuts contains 783 footnotes and a selected bibliography of 14 excellent basic works on this subject. While the average physician may not find this volume of much practical value, the nutritionist, dietitian, and student will certainly not want to be without it.

Introduction to Modern Chemistry. By P. C. Gaines, Professor of Chemistry, Laurence O. Binder, Jr., Associate Professor of Chemistry, and Ray Woodruff, Associate Professor of Chemistry, Montana State College, Bozeman. Cloth. $4.75. Pp. 576, with 92 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1951.

This book is outstanding among elementary chemistry texts for its high degree of clarity and accuracy. Most of the subject matter and its arrangement are not unusual, but the metals are treated in the order in which their cations are precipitated during qualitative analysis, rather than by families in the periodic table. The paper and binding are better than usual.

QUERIES AND MINOR NOTES

CORONARY DISEASE IN DRIVERS OF PUBLIC CONVEYANCES

TO THE EDITOR:—*Should a man who has had coronary thrombosis or myocardial infarction or who shows evidence of coronary heart disease return to work as a bus driver? I would advise my patient to procure a less strenuous job not only for his own good but also because of the risk to the public and the liability of the employer in permitting him to drive a bus. I would appreciate your opinion.*

Louis V. Jurich, M.D., New York.

ANSWER.—It is generally deemed unwise to permit any patient who gives a past or current history of coronary heart disease to drive any public conveyance or to be responsible for any duty that would endanger more than his or her own life. This would, of course, include bus drivers and locomotive engineers.

LIBIDO AFTER HYSTERECTOMY

TO THE EDITOR:—*A woman, whose uterus, ovaries, and tubes have been removed, continues to have normal satisfaction from and desire for coitus. Her husband assumes she is unable to react normally, and therefore refrains from intercourse. Is the sex urge necessarily terminated by this surgery?*

M.D., California.

ANSWER.—The husband is completely wrong in his attitude, and, since his wife has demonstrated to him the incorrectness of his opinion, one wonders whether this is his only reason for refraining from intercourse with her. He should discuss the matter with the wife's physician or gynecologist. Hysterectomy in itself should not lessen libido. As to the role of the ovaries, in the human female the psyche plays a far more important role, and the ovaries often a negligible one. Libido is often actually increased after castration or after the menopause. There are many auxiliary factors to be considered.

LOW BLOOD SUGAR AND CONVULSIVE SEIZURES

TO THE EDITOR:—*A patient, who is six months pregnant, has had some seizures, which were diagnosed as grand mal. Her blood sugar was 45 mg. per 100 cc. on one occasion and 63 and 64 mg. per 100 cc. on two other occasions. What examinations or tests will enable me to make a definite differentiation between grand mal and hypoglycemia?*

Joel L. E. Peterson, M.D., St. Paul, Minn.

ANSWER.—Time relations of the blood sampling to ingestion of food and to convulsions is not stated. The degree of hypoglycemia observed should not in itself be sufficient to cause convulsive reactions. Convulsions should occur only after a period of fasting and be preceded by symptoms such as hunger, sweating, and weakness. Differential tests would include a four hour blood sugar curve, blood sugar and clinical response to the injection of insulin, and an electroencephalogram, made preferably with the patient fasting.

RIVERS' COCKTAIL AND ACUTE ALCOHOLISM

TO THE EDITOR:—*Please tell me the ingredients and method of use of Rivers' cocktail for alcoholic patients.*

E. M. Henderson, M.D., Nassawadox, Va.

ANSWER.—Rivers' cocktail, also known as the Philadelphia cocktail, is used for detoxification in acute alcoholism, provided the patient's physical condition can stand an intravenous injection of bulk solution. As used now, the solution injected consists of 1,000 to 2,000 cc. of 10% dextrose in isotonic saline solution, which can be obtained for intravenous purposes from any of the large hospital supply companies. After the drip, intravenous flow is started, and as it goes on, 100,000 to 200,000 units of thiamine hydrochloride (vitamin B_1) and 25 units of insulin are introduced into the tubing. Candy, heavily sugared orange juice, and concentrated glucose for intravenous administration should be available if mild insulin shock reactions occur. It is sometimes necessary to repeat this procedure in four hours.

LECITHIN AND CORONARY INSUFFICIENCY

TO THE EDITOR:—*A friend who had a coronary occlusion claims that he was relieved of severe pains in all extremities by taking daily one teaspoonful of lecithin in cereal. This is marketed by the Glidden Company, in whose brochure are described the merits of lecithin in atherosclerosis in furnishing the necessary choline and inositol. The soybean is said to be rich in lecithin. What can you tell me about this?*

I. Fleiss, M.D., New York.

ANSWER.—It is not likely that lecithin added to the diet would have any immediate or early effect on the pains of coronary insufficiency. It is possible that there may be a remote benefit from its use, but this has not yet been proved. The natural tendency of coronary insufficiency to decrease, and not infrequently to disappear entirely, through the spontaneous development of a more adequate collateral coronary circulation makes dubious the value of therapy of coronary heart disease that has not been clearly proved to be beneficial. One should remain skeptical and yet open-minded about all such treatment.

PERINEURAL FIBROSARCOMA OF THE BREAST

TO THE EDITOR:—*A woman, 22, had a small nodule in the right breast removed in November, 1948. The biopsy results were negative for malignancy. She returned, Jan. 1, 1951, with reddened subcutaneous nodules on each side of the old incision. She was admitted to the hospital for removal of the involved area, and a biopsy revealed perineural fibrosarcoma. Although the pathologist suggested either simple mastectomy or wider local excision, she was subjected to a radical mastectomy, and no residual tumor was found throughout the breast or axillary lymph nodes. Now she is presumably six weeks pregnant. Assuming she had a slow-growing type of sarcoma that was locally invasive, the problem arises as to whether to let her continue with pregnancy or to interrupt it by dilatation and curettage.* *M.D., Alabama.*

ANSWER.—This patient may safely be permitted to continue her pregnancy. There is no evidence whatever that pregnancy or hormones will bring about a return of the fibrosarcoma. It is almost certain that the entire diseased area was removed by the operation and that there are no remote metastases. Incidentally, a radical mastectomy was heroic treatment for the perineural fibrosarcoma.

COMMERCIAL OXYGEN VERSUS MEDICAL OXYGEN

TO THE EDITOR:—*A patient contends, on seemingly good authority, that there is no difference between the oxygen sold for medical use and that employed in industry, despite the tremendous difference in cost. Is there a difference?*

Elmer A. Kleefield, M.D., Forest Hills, N. Y.

ANSWER.—There is no difference between so-called medical oxygen and commercial oxygen. This was checked with two firms who supply both medical and technical oxygen and two prominent anesthesiologists. There may be differences in the valve thread and color of the container.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.